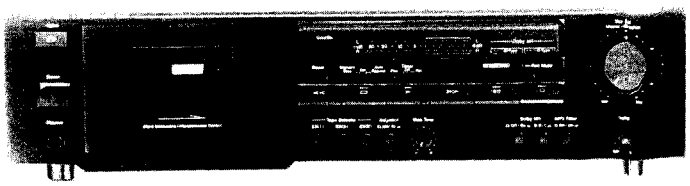
Nakamichi

Service Manual

Nakamichi

CR-2
CR-2A
CR-2E
CR-20

2 Head Cassette Deck



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1. GENERAL

1.1. Voltage Selector

Voltage selector is installed on the rear panel for Other version of the Nakamichi CR-2.
This voltage selector can select 110, 127, 220, or 240 V at customer's disposal.

1.2. Package Ass'y and Accessory Ass'y

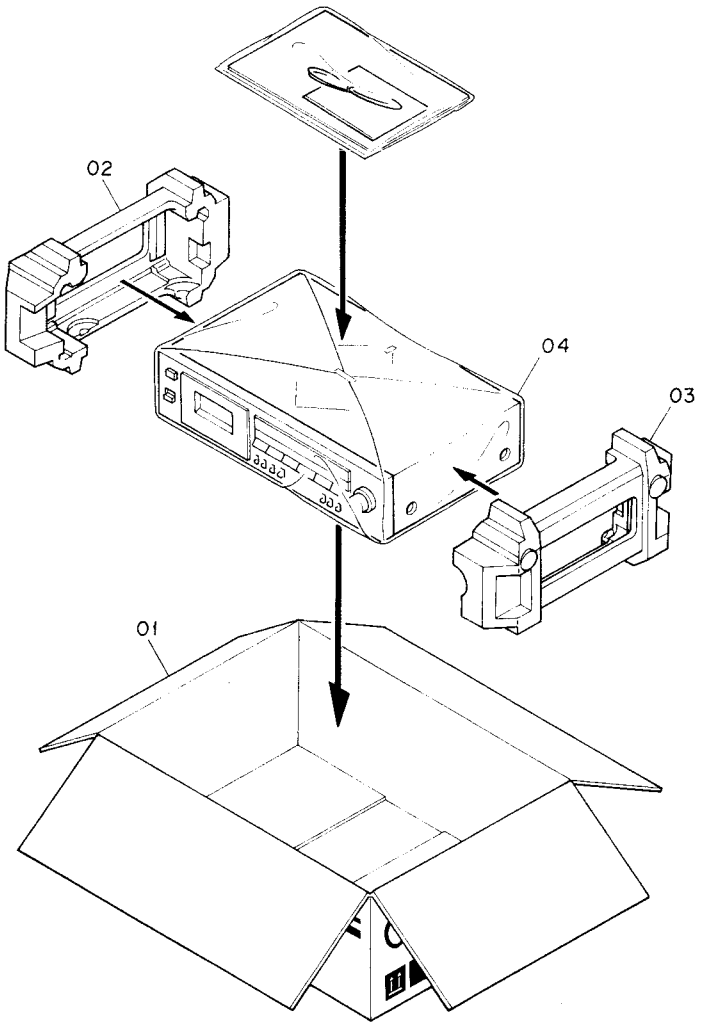


Fig. 1

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
		Package Ass'y	1			**Accessory Ass'y**	1
01	0F04070A	Carton Box (CR-2)	1		0D03092B	Poly-Bag	1
	0F04071A	Carton Box (CR-2A)	1		0D04449A	Important Notice (CR-2, CR-2E & CR-20)	1
	0F04072A	Carton Box (CR-2E)	1				
	0F04100A	Carton Box (CR-20)	1		0D04810A	Important Notice (CR-2A)	1
02	0F04087C	Packing L	1		0D04766A	General Catalogue (CR-2A)	1
03	0F04088C	Packing R	1		0D04780B	Owner's Manual (English/ German/French)	1
04	0F03684A	Poly-Sheet S	1				
	0D04046A	Warranty Card (CR-20)	1		0D04781B	Owner's Manual (Japanese)	1
	0D04047A	User's Pack (CR-20)	1		0D04785B	Price Card (CR-20)	1
	0M03457A	Voltage Label 240V (CR-2 (Australia) & CR 2E (UK))	2		0D04796A	Tape Catalogue (CR-2A)	1
					0D04795A	Tape Catalogue (CR-20)	1
	0M05101A	Voltage Label (CR-2 (Saudi Arabia))	2		0D04797A	Warranty Card (CR-2A)	1
					0D04812A	Tape Supplement	1
	0M05070A	Serial No. Label (CR-2A)	2		0M03844B	Power Cord Label (CR-2E (UK))	1
	0M05054A	Serial No. Label (CR-2, CR-2E & CR-20)	1		DA04121A	Pin Cord Ass'y	1
	0M05087A	Point of Sale Label (CR-20)	1				
	0M05106A	UL Label (CR-2A)	1				
	0M05105A	LA Label (CR-2A)	1				
	0M05107A	Canada Label (CR-2A)	1				
	0M05108A	UL/Canada Label (CR-2A)	1				
	0M05102A	Shipping Label Los (CR-2A)	1				
	0M05103A	Shipping Label VAN (CR-2A)	1				

2. REMOVAL PROCEDURES

2.1. Top Cover Ass'y and Bottom Cover Ass'y
Refer to Fig. 2.1.
(1) Loosen F01 and remove F02 (Top Cover Ass'y).
(2) Loosen F03 and remove F04 (Bottom Cover Ass'y).

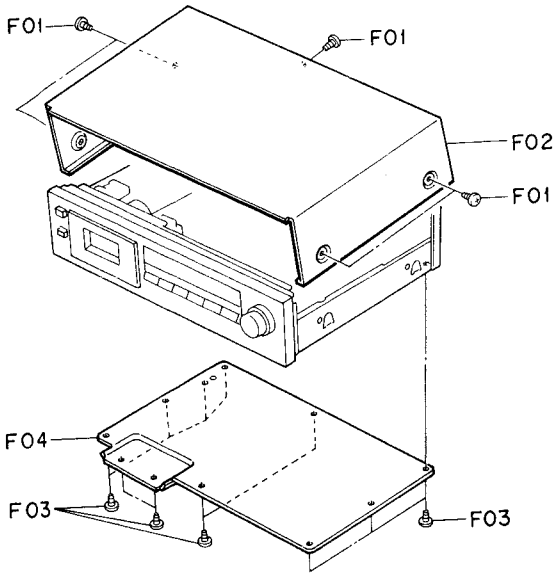


Fig. 2.1

2.2. Cassette Case Cover Ass'y
Refer to Fig. 2.2.
(1) Press F01 (Eject Button) to open F02 (Cassette Case Cover Ass'y).
(2) Pull F02 (Cassette Case Cover Ass'y) upward.

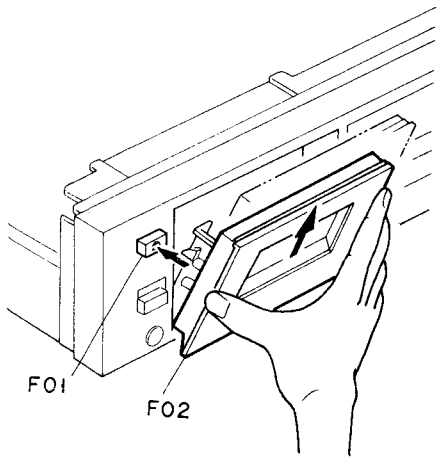


Fig. 2.2

2.3. Mechanism Ass'y
Refer to Fig. 2.3.
(1) Remove the Top Cover Ass'y and the Bottom Cover Ass'y referring to item 2.1.
(2) Remove the Cassette Case Cover Ass'y referring to item 2.2.
(3) Loosen F01 and F02, remove F03, and disassemble F04 (Mechanism Ass'y).

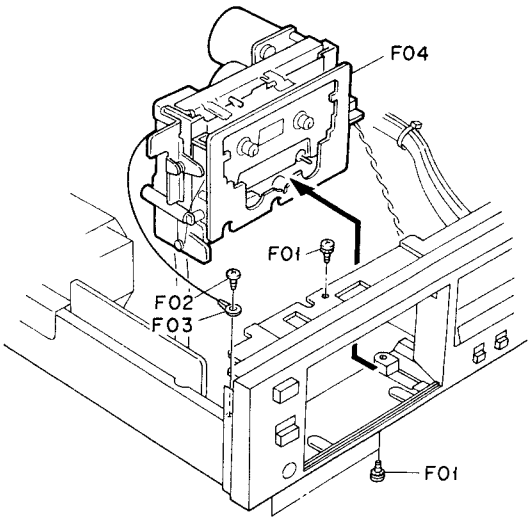


Fig. 2.3

2.4. Pin Jack P.C.B. Ass'y and Main P.C.B. Ass'y
Refer to Fig. 2.4.
(1) Remove the Top Cover Ass'y and the Bottom Cover Ass'y referring to item 2.1.
(2) Loosen F01 and remove F02 (Pin Jack P.C.B. Ass'y).
(3) Loosen F03 and F04, and lift F05 (Main P.C.B. Ass'y).
Note: When installing the Main P.C.B. Ass'y, to facilitate installation, place the Main P.C.B. Ass'y so that the tops of switches on the Main P.C.B. Ass'y come in contact with the ends of push buttons as shown in Fig. 2.5.

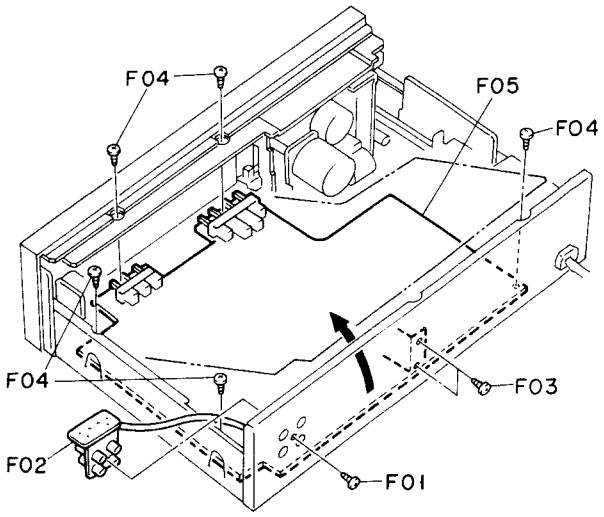


Fig. 2.4

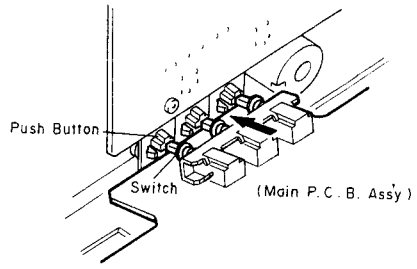


Fig. 2.5

2.5. Front Panel
Refer to Fig. 2.6.
(1) Remove the Top Cover Ass'y and the Bottom Cover Ass'y referring to item 2.1.
(2) Remove the Cassette Case Cover Ass'y referring to item 2.2.
(3) Pull out F01, F02 and F03, and loosen F04 and F05.
(4) With pushing claws by hand as shown in the figure, remove F06 (Front Panel).

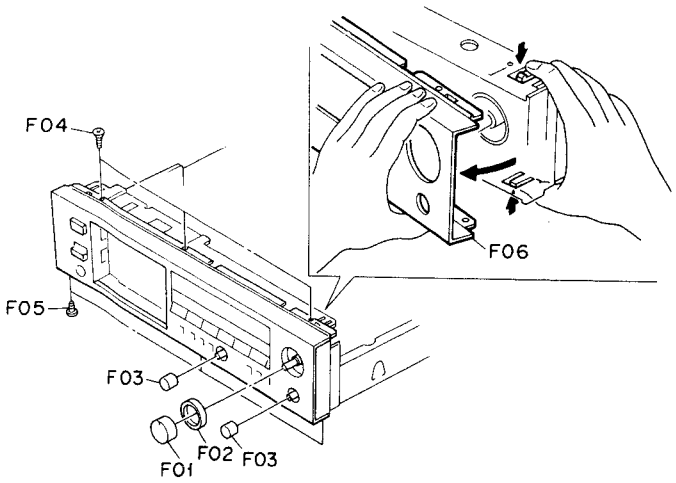


Fig. 2.6

2.6. Bias Tune Volume P.C.B. Ass'y
Refer to Fig. 2.7.
(1) Remove the Top Cover Ass'y and the Bottom Cover Ass'y referring to item 2.1.
(2) Remove the Main P.C.B. Ass'y referring to item 2.4.
(3) Remove the Front Panel referring to item 2.5.
(4) Loosen F01 and F02 with a special nut driver or with pliers, and remove F03 (Bias Tune Volume P.C.B. Ass'y).

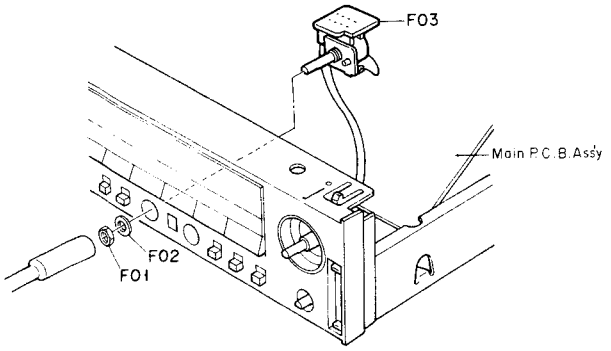


Fig. 2.7

2.7. Control P.C.B. Ass'y
Refer to Fig. 2.8.
(1) Remove the Top Cover Ass'y and the Bottom Cover Ass'y referring to item 2.1.
(2) Remove the Mechanism Ass'y referring to item 2.3.
(3) Remove the Front Panel referring to item 2.5.
(4) Loosen F01 and F02 with a special nut driver or with pliers to set F03 (Bias Tune Volume P.C.B. Ass'y) free.
(5) With pushing F03 (Bias Tune Volume P.C.B. Ass'y) in the direction of the arrow, loosen F04, unhook F05, and remove F06 (Control P.C.B. Ass'y).

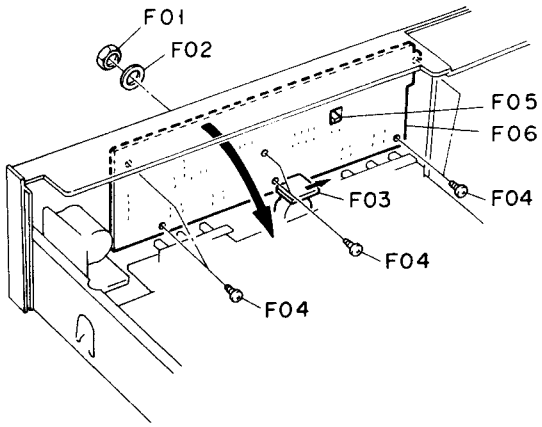


Fig. 2.8

2.8. Power Switch Joint
Refer to Fig. 2.9.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Pull F01 (Power Switch Joint) upward to remove it.

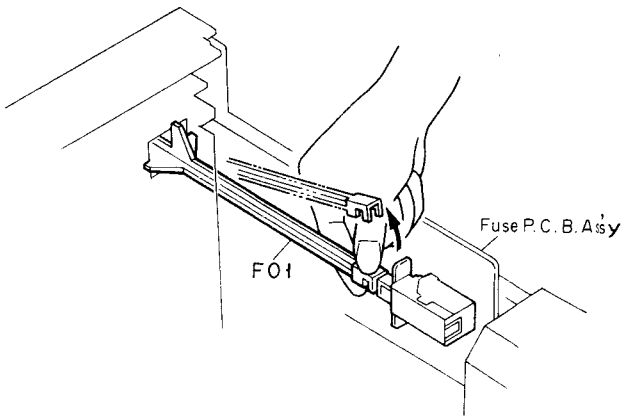


Fig. 2.9

3. TEST TAPES AND GAUGES

(1) 400 Hz Level Tape (DA09005B)
(2) 1 kHz Track Alignment Tape (DA09007B)
(3) 10 kHz PB Frequency Response Tape (DA09003B)
(4) 15 kHz PB Frequency Response Tape (DA09002B)
(5) 20 kHz PB Frequency Response Tape (DA09001B)
(6) 15 kHz Azimuth Tape (DA09004B)
(7) 3 kHz Speed and Wow/Flutter Tape (DA09006C)
(8) Tape Travelling Cassette (DA09071A)
(9) Reference EXII Tape (DA09111A)
(10) Reference SX Tape (DA09110A)
(11) Reference ZX Tape (DA09109A)
(12) Head Alignment Gauge (DA09092B)
(13) Torque Gauge FWD (DA09082A)

4. MECHANICAL ADJUSTMENTS

4.1. Tape Guide Height Check for Record/Playback Head and Erase Head

With use of a Head Alignment Gauge (DA09092B), tape guide height check for the Record/Playback and Erase Heads shall be made, wherein a small block shall be pushed straight down to the base while in use of the Head Alignment Gauge (DA09092B).
Refer to Fig. 4.1.

(1) Record/Playback Head Tape Guide Height

(a) Load the base of the Head Alignment Gauge (DA09092B) carefully and set the cassette deck in Play mode.
(b) Place the small block of the Head Alignment Gauge (DA09092B) on the base.
(c) Slide the small block against the tape guide of the Record/Playback Head, and check to insure that the block is accepted by the tape guide.
(d) If not, loosen the screw and insert a shim (either 30 μm (0C80048A), 60 μm (0C80038A), or 100 μm (0C80039A)) to raise the Record/Playback Head, then tighten and apply a quantity of lock tight paint to the screw.

(2) Erase Head Tape Guide Height

(a) Load the base of the Head Alignment Gauge (DA09092B) carefully and set the cassette deck in Play mode.
(b) Place the small block of the Head Alignment Gauge (DA09092B) on the base.
(c) Slide the small block against the tape guide of the Erase Head, and check whether the block is accepted by the tape guide.

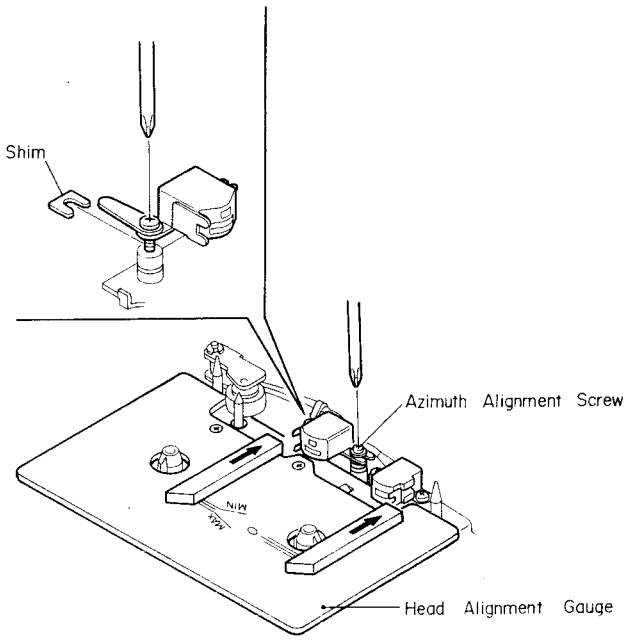


Fig. 4.1

4.2. Head Base Stroke Check

Refer to Fig. 4.2.

(1) Load the base of the Head Alignment Gauge (DA09092B) carefully, then push the base toward the Record/Playback Head to eliminate the clearance between the reference pin and the base.
(2) Set the cassette deck in Play mode.
(3) Place the small block of the Head Alignment Gauge (DA09092B) on the base.
(4) Contact the small block with the Record/Playback Head surface and the Erase Head surface, and check whether the end of the small block is located within the specified tolerance as shown in Fig. 4.2.

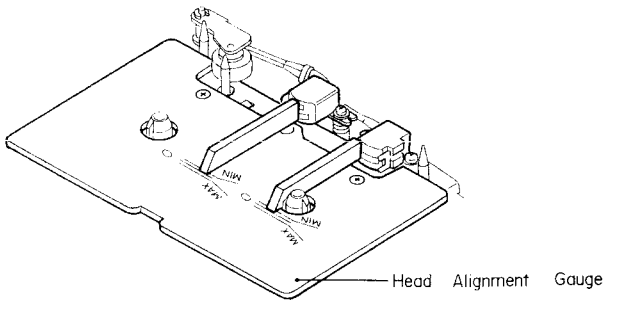


Fig. 4.2

4.3. Record/Playback Head Azimuth Alignment and Height Check

Refer to Fig. 4.1.

(1) Contact an AC voltmeter to the Output Jacks.
(2) Load a 15 kHz Azimuth Tape (DA09004B) and set the cassette deck in Play mode.
(3) Turn the Azimuth Alignment Screw until the outputs of both channels become maximum.
(4) Load a 1 kHz Track Alignment Tape (DA09007B) and set the cassette deck in Play mode.
(5) Check to insure that the readings of both channels on the AC voltmeter are below −25 dB.
If not, replacement of the Record/Playback Head will be required.
(6) Apply a quantity of lock tight paint to the Azimuth Alignment Screw.

4.4. Pressure Adjustment of Pressure Roller

Refer to Fig. 4.3.

(1) In Play mode, measure the torque of the Pressure Roller and check whether the torque is in a range of 320 ±50 g-cm.

(2) If torque is out of the range, correct it by changing the installation point of the Pressure Roller Spring.

4.5. Tape Travelling Check

Load a Tape Travelling Cassette (DA09071A) and set the cassette deck in Play mode to check the followings:

(1) After more than 2 seconds, the fluctuation of the tape travelling on the Record/Playback Head is small.

(2) Tape is in contact with the head sufficiently.

(3) Tape waving is small on the heads and pressure roller.

4.6. Eject Damper Adjustment

Refer to Fig. 4.4. Load a cassette tape, and with opening the Cassette Case by pressing the Eject button and closing it by hand, adjust the speed of damper action by the Damper Adjustment Screw.

CCW: Damper moves fast.
CW: Damper moves slowly.

4.7. Reel Motor Speed Adjustment in Play Mode

(1) Load a Torque Gauge FWD (DA09082A) and set the cassette deck in Play mode.

(2) After 5 to 10 seconds, adjust VR601 on the Main P.C.B. Ass'y to obtain exactly 45 g-cm on the torque gauge.

4.8. Tape Speed Adjustment

Refer to Fig. 4.5.

(1) Connect a frequency counter to the Output Jacks.

(2) Load a 3 kHz Speed and Wow/Flutter Tape (DA09006C) and play it back.

(3) Adjust the Tape Speed Adjustment Volume incorporated in the Capstan Motor to obtain 3,000 Hz on the frequency couter.

CCW: Motor drives slowly.
CW: Motor drives fast.

4.9. Lubrication

The tape transport is of a lubrication-free type mechanism. When the following parts are replaced, apply the specified lubricant.

(1) Molykote Ⓡ Grease (X5-6020)
Cam Motor Pulley
Thrust portion on the Capstan Shaft

(2) FLOIL GB-TS-1
Washer between Reel Hub Ass'y and Back Tension Spring

(3) Diamond Oil (EP-56)
Reel Hub Shaft

(4) Anderol 456
Capstan Shaft

Note: We suggest that you use the above specified lubricant or equivalent type.
The company dealing in the above lubricant is as follows:

(a) Molykote Ⓡ Grease (X5-6020)
Dowcorning Co., Ltd., 1-15-1 Nishishinbashi, Minato-ku, Tokyo, Japan

(b) FLOIL GB-TS-1
Kanto Chemicals Co., Ltd., 2-7 Kanda Sakuma-cho, Chiyoda-ku, Tokyo, Japan

(c) Diamond Oil (EP-56)
Mitsubishi Oil Co., Ltd., 1-2-4 Toranomon, Minato-ku, Tokyo, Japan

(d) Anderol 456
Toyo Kokusai Oil Co., Ltd., 3-3-5 Hatchobori, Chuo-ku, Tokyo, Japan

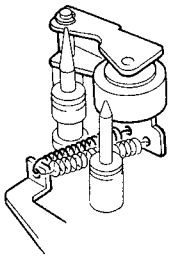


Fig. 4.3

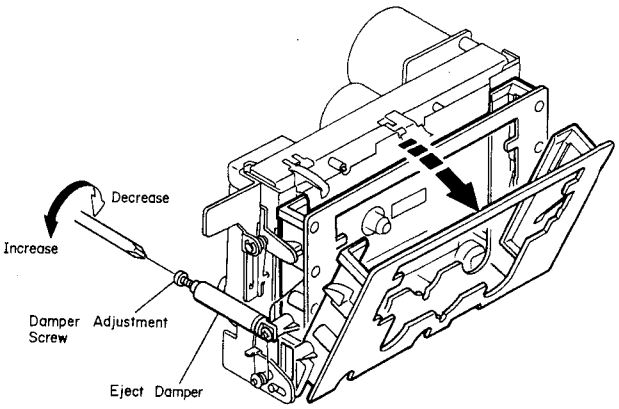


Fig. 4.4

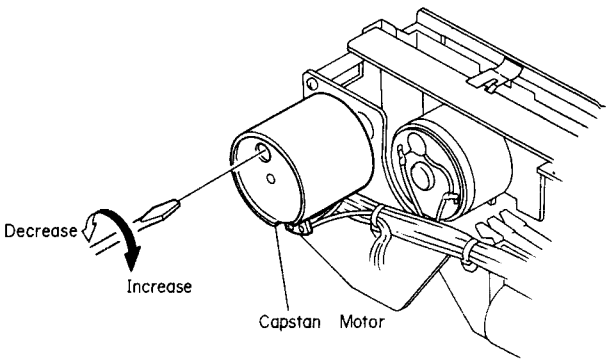


Fig. 4.5

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

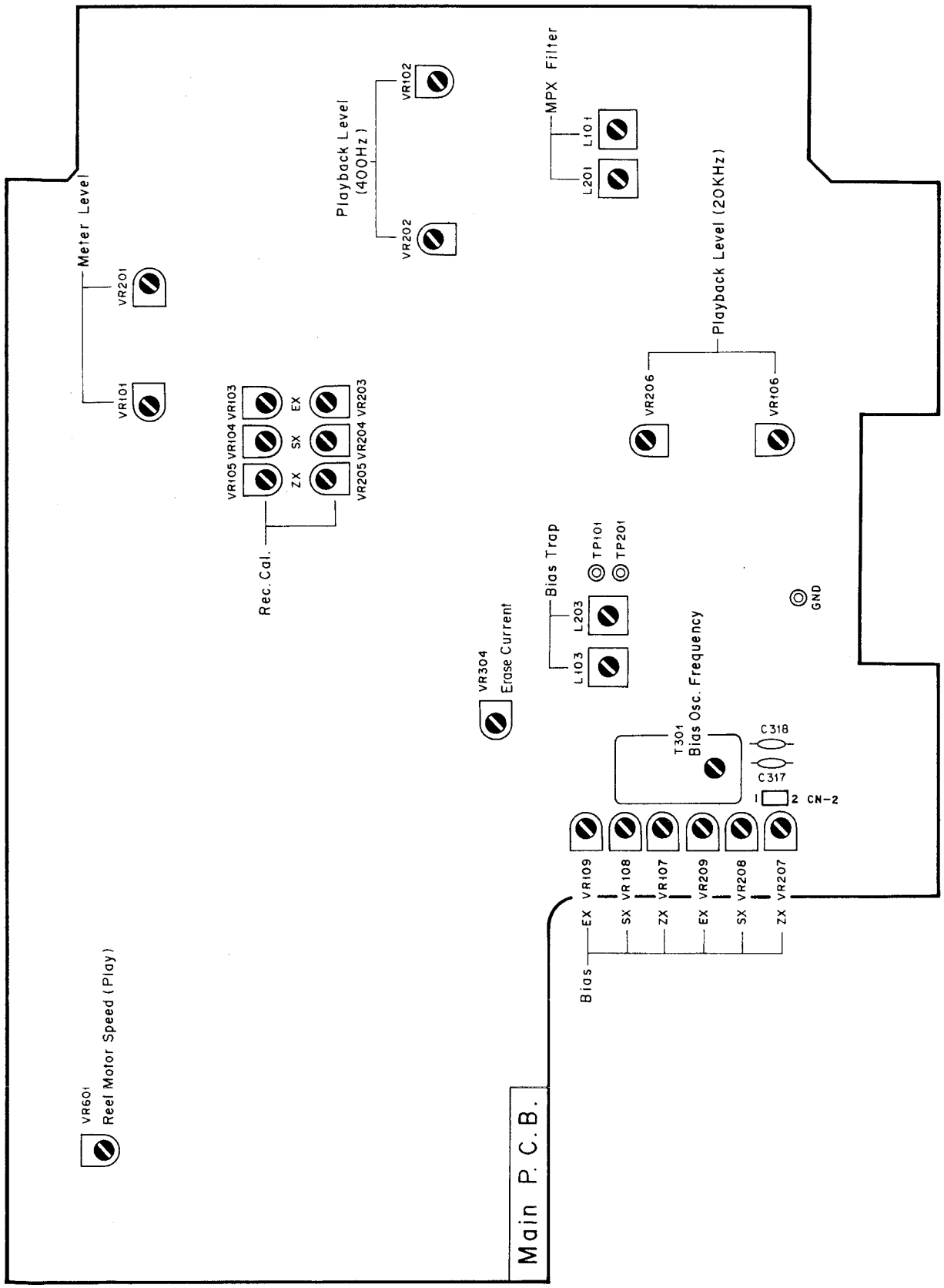
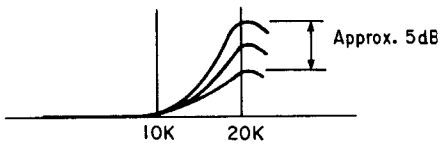


Fig. 5

6. ELECTRICAL ADJUSTMENTS

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
1	Preliminary Step			**Outpu Level - Max.** Balance - Center **Bias Tune - Center** Eq. - 70 µs Tape - ZX MPX Filter - OFF Dolby NR - OFF		Set the CR-2/2A/2E/20 as shown in MODE.
2	Reel Motor Speed Adjustment (Play)	Torque Gauge FWD (DA09082A)		Playback	Main VR601	1. Play back a Torque Gauge FWD, and after 5 to 10 seconds, adjust VR601 to obtain 44 ± 1 g-cm on the Torque Gauge at 25 degrees (45 ± 1 g-cm at 20 degrees). 2. Check that the deviation of the torque value is within ±10 g-cm of the center value. Note: Torque adjustment must be done after leaving the CR-2/2A/2E/20 for one hour with the power switch turned OFF.
3	Tape Speed Adjustment	3 kHz Speed and Wow/ Flutter Tape (DA09006C)	Frequency Counter to Output Jacks	Playback Eq. - 70 µs	Tape Speed Adj. Volume (Capstan Motor)	Adjust the volume incorporated in the capstan motor to obtain 3 kHz ±15 Hz on the frequency counter.
4	Meter Level Calibration	400 Hz to Input Jacks	AC Volt-meter to Output Jacks	Record,Pause	Main P.C.B. VR101 VR201	1. Feed in 400 Hz and adjust the Input Level control to obtain 500 mV -1.2 dB on the AC voltmeter. 2. Adjust VR101 (VR201) so that the 0 dB segment of the level meter starts illuminating.
5	MPX Filter Adjustment	19 kHz ±100 Hz to Input Jacks	AC Volt-meter to Output Jacks	Record,Pause MPX - OFF/ON	Main P.C.B. L101 L201	1. Adjust the Input Level control to obtain 500 mV (0 dB) on the AC voltmeter. 2. Set the MPX Filter switch to ON and adjust L101 (L201) to obtain minimum reading on the AC voltmeter (minimum reading will be less than -30 dB).
6	Record/ Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004B)	AC Volt-meter to Output Jacks	Playback Eq. - 70 µs Dolby NR - OFF MPX - OFF	Record/ Playback Head Azimuth Align-ment Screw	Adjust the Record/Playback Head Azimuth Alignment Screw to obtain maximum readings for both channels on the AC voltmeter.
7	Playback Level Calibration	400 Hz Level Tape (DA09005B)	AC Volt-meter to Output Jacks	Same as above	Main P.C.B. VR102 VR202	Adjust VR102 (VR202) to obtain 500 mV on the AC voltmeter.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
8	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005B) 10 kHz PB Frequency Response Tape (DA09003B) 15 kHz PB Frequency Response Tape (DA09002B) 20 kHz PB Frequency Response Tape (DA09001B)	AC Volt-meter to Output Jacks	Playback Eq. - 70 μs Dolby NR - OFF MPX - OFF	Main P.C.B. VR106 VR206	1. Load a 400 Hz level tape, play it back, and read the playback level. 2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and play them back. Adjust the record/playback head azimuth to obtain maximum readings for both channels on the AC voltmeter with each tape. Check that the playback levels are as follows with respect to the level for 400 Hz level tape. 10 kHz: -20 dB -2 to +2 dB 15 kHz: -20 dB -2 to +3 dB 20 kHz: -20 dB -2 to +4 dB If the level at 20 kHz is out of the range, adjust VR106 (VR206) to obtain satisfactory results. VR106 (VR206) compensates the playback frequency response at 20 kHz as shown below:  3. Conduct step 6 "Record/Playback Head Azimuth Alignment".
9	Bias Oscillation Frequency and Erase Current Adjustment	None	Frequency Counter between terminals 1 and 2 of CN2 on Main P.C.B. and AC Volt-meter across the additional 0.1 ohm resistor	Record,Pause Eq. - 70 μs Tape ZX Dolby NR - OFF MPX - OFF	Main P.C.B. T301 C317 C318 VR304	1. Connect an additional 0.1 ohm resistor in series to the Erase Head and connect the AC voltmeter across it. 2. Adjust T301 to obtain 105 kHz ±1 kHz on the frequency counter. If bias oscillation frequency is above 106 kHz, short-circuit C317 and C318, and re-adjust T301 again. 3. Adjust VR304 to obtain 17.5 mV (175 mA) on the AC voltmeter. (16.5 ± 1 mV (165 ± 10 mA will be accepted.) 4. After completion of the erase current adjustment, re-check the bias oscillation frequency. 5. Remove the additional 0.1 ohm resistor.
10	Bias Trap Adjustment (Record Amp.)	None (remove input signals)	AC Volt-meter to TP101,TP201 on Main P.C.B.	Same as above	Main P.C.B. L103 L203	Adjust L103 (L203) to obtain minimum reading on the AC voltmeter.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
11	Record Level Calibration and Recording Bias Current Adjustment	400 Hz (0 dB) and 18 kHz (-20 dB) to Input Jacks	AC Volt-meter and Distortion Meter to Output Jacks	Record and Playback Tape - ZX/SX/EX Eq. - 70 µs (ZX/SX) 120 µs (EX) Dolby NR - OFF/C MPX - OFF	Main P.C.B. (Level) ZX: VR105 VR205 SX: VR104 VR204 EX: VR103 VR203 (Bias) ZX: VR107 VR207 SX: VR108 VR208 EX: VR109 VR209	Adjustment should be made in the order of ZX, SX and EX. 1. Set the cassette deck in Record/Pause mode. 2. Feed in 400 Hz and adjust the Input Level control to obtain 500 mV (0 dB) on the AC voltmeter. 3. Load a reference ZX tpae, reference SX tape and reference EXII tape. 4. Set the Dolby NR switch to OFF. 5. Feed in 400 Hz (0 dB) and record, rewind and play it back. Adjust VR105 (VR205) for ZX tape, VR104 (VR204) for SX Tape and VR103 (VR203) for EXII tape so that the played back output levels are 500 mV (0 dB) on the AC voltmeter. 6. Set the Dolby NR switch to C. 7. Feed in 18 kHz (-20 dB) and record, rewind and play it back. Adjust VR107 (VR207) for ZX tape, VR108 (VR208) for SX tape and VR109 (VR209) for EXII tape so that the played back output levels are 50 mV (-20 dB) on the AC voltmeter. 8. Repeat above 4 to 8 two or three times. 9. Set the Dolby NR switch to OFF. 10. Feed in 400 Hz (0 dB) and record, rewind and play it back. Check to insure whether the total harmonic distortion is less than 1.0% for ZX, SX and EXII tapes. If the total harmonic distortion exceeds the specified value, re-adjust VR106 (VR206) in Step 8 "Playback Frequeney Response Adjustment", and repeat above steps till satisfactory results are obtained.

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

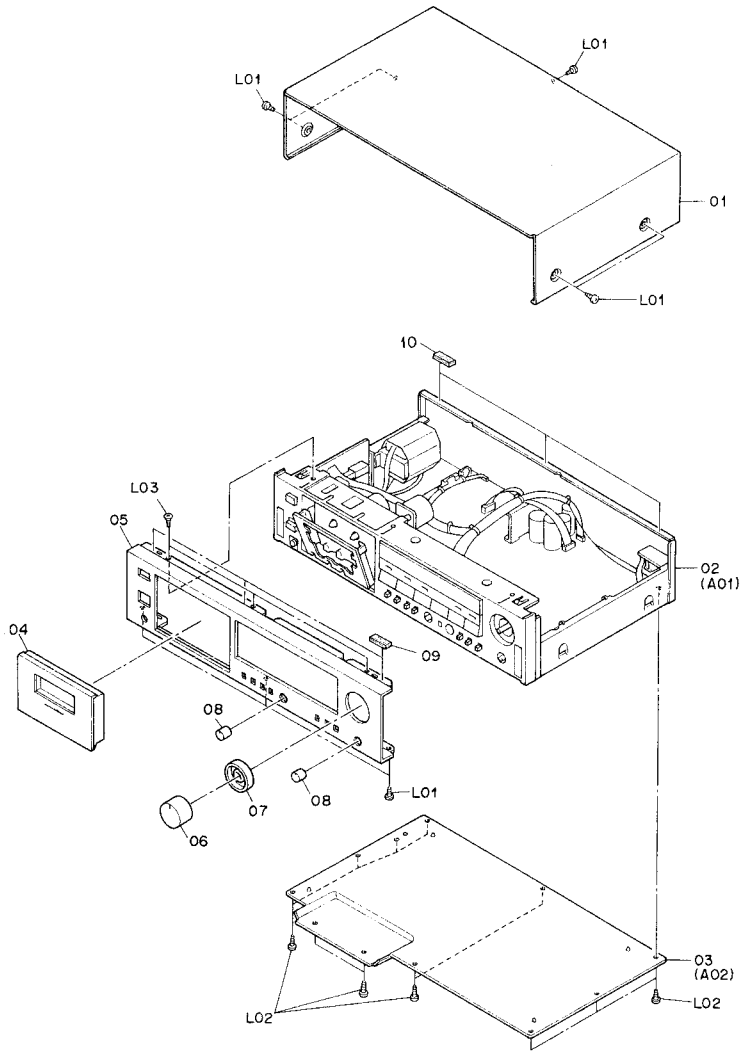


Fig. 7.1

Schematic Ref. No.	Part No.	Description	Q'ty
7.1. Synthesis			
		Synthesis	
		Serial No.: A32501001 -	
01	0H05111A	Top Cover	1
02	JA04308A	Chassis Ass'y (CR-2 (Australia))	1
	JA04307A	Chassis Ass'y (CR-2 (Other))	1
	JA04310A	Chassis Ass'y (CR-2 (Saudi Arabia))	1
	JA04311A	Chassis Ass'y (CR-2A (U.S.A.))	1
	JA04305A	Chassis Ass'y (CR-2A (Canada))	1
	JA04309A	Chassis Ass'y (CR-2E (Europe))	1
	JA04304A	Chassis Ass'y (CR-2E (UK))	1
	JA04306A	Chassis Ass'y (CR-20 (Japan))	1
03	JA04319A	Bottom Cover Ass'y (CR-2 & CR-2E)	1
	JA04329A	Bottom Cover Ass'y (CR-2A)	1
	JA04340A	Bottom Cover Ass'y (CR-20)	1
04	HA05313A	Cassette Case Cover Ass'y	1
05	0H05134B	Front Panel (CR-2)	1
	0H05132B	Front Panel (CR-2A)	1
	0H05133B	Front Panel (CR-2E)	1
	0H05135B	Front Panel (CR-20)	1
06	HA05340A	Rec. Volume Knob Ass'y	1
07	HA05338A	Rec. Balance Knob Ass'y	1
08	HA05339A	Bias Volume Knob Ass'y	2
09	0J05453A	Top Cover Cushion	3
10	0J05407A	Top Cover Sheet	3
L01	0E03433A	BT3x6 ⊕ Binding Projected (Black Chromate)	8
L02	0E00868A	BT3x8 ⊕ Binding	11
L03	0E03054A	BT3x8 ⊕ Countersunk	3
—	0M03797A	Voltage Seal 240V (CR-2E (UK))	1
—	0M03844B	Power Cord Label (CR-2E (UK))	1
—	0M05148A	Production Date Seal (CR-2A)	1
—	0M04381A	EP Approval Label (CR-2E (Europe))	1
—	0M04732A	Voltage Label 120V (CR-2A (Canada))	1
—	0M04811A	Voltage Caution Sheet (CR-2 (Other & Saudi Arabia))	1
—	0M05065A	Passed Label	1
—	0M05067A	CSA Approval Label (CR-2A (Canada))	1
—	0M05068A	LA Label (CR-2A (U.S.A.))	1
—	0M05070A	Serial No. Seal (CR-2A)	1
—	0M05114A	Amp. Number Seal	1
—	0M05111A	F. Mark Approval Seal (CR-2E (Europe))	1
—	MA01001A	F. Code Label Ass'y (CR-2, CR-2E & CR-20)	1

Schematic Ref. No.	Part No.	Description	Q'ty
7.2. Chassis Ass'y (A01)			
A01	JA04308A	Chassis Ass'y (CR-2 (Australia))	1
	JA04307A	Chassis Ass'y (CR-2 (Other))	1
	JA04310A	Chassis Ass'y (CR-2 (Saudi Arabia))	1
	JA04311A	Chassis Ass'y (CR-2A (U.S.A.))	1
	JA04305A	Chassis Ass'y (CR 2A (Canada))	1
	JA04309A	Chassis Ass'y (CR-2E (Europe))	1
	JA04304A	Chassis Ass'y (CR-2E (UK))	1
	JA04306A	Chassis Ass'y (CR-20 (Japan)) Serial No.: A32501001 -	1
01	0J05427A	Mount Plate	1
02	HA05308A	Front Escutcheon Ass'y	1
03	BA06969A	Headphone P.C.B. Ass'y	1
04	BA06968A	Bias Tune Volume P.C.B. Ass'y	1
05	0H05095A	Slide Button	2
06	BA06961A	Control P.C.B. Ass'y	1
07	BA06967A	Output Volume P.C.B. Ass'y	1
08	BA06966A	Input Volume P.C.B. Ass'y	1
09	0H05165A	Cover Plate	1
10	0B12580A	LED P Green SLF-725D	1
11	CA08886A	Mechanism Ass'y	1
12	0B83255A	GND Wire Ass'y	1
13	0B83132A	2P Connector	1
14	0J05402A	Power Switch Joint	1
15	BA06964A	Fuse P.C.B. Ass'y (CR-2 & CR-2E)	1
	BA06963A	Fuse P.C.B. Ass'y (CR-2A)	1
	BA06965A	Fuse P.C.B. Ass'y (CR-20)	1
16	0J05417C	Transformer Holder	1
17	0B50100A	Power Transformer (CR-2 (Australia) & CR-2E)	1
	0B50101A	Power Transformer (CR-2 (Other & Saudi Arabia))	1
	0B50099A	Power Transformer (CR-2A)	1
	0B50102A	Power Transformer (CR-20)	1
18	0J05392A	Side Chassis L	1
19	BA06947A	Main P.C.B. Ass'y	1
20	0J05451A	P.C.B. Cushion	1
21	0J05394A	P.C.B. Holder Front	2
22	0B05241A	Power Code (CR-2 (Australia))	1
	0B08533A	Power Code (CR-2 (Other & Saudi Arabia))	1
	0B08504A	Power Code (CR-2A)	1
	0B08093U	Power Code (CR-2E (Europe))	1
	0B08348A	Power Code (CR 2E (UK))	1
	0B08219B	Power Code (CR-20)	1
23	0B90280A	Cord Bushing (CR-2 (Australia), CR-2A & CR-2E)	1
	0B90283A	Cord Bushing (CR-2 (Other & Saudi Arabia) & CR-20)	1
24	BA06970A	Pin Jack P.C.B. Ass'y	1
25	0J05395A	P.C.B. Holder Rear	1
26	0H05146B	Rear Panel (CR-2 (Australia))	1
	0H05148B	Rear Panel (CR-2 (Other & Saudi Arabia))	1
	0H05144B	Rear Panel (CR-2A)	1
	0H05145B	Rear Panel (CR-2E)	1
	0H05147B	Rear Panel (CR-20)	1
27	0J05393A	Side Chassis R	1
28	0B08515A	Insu-Lock	18
29	0B81771A	Voltage Selector (CR-2 (Other & Saudi Arabia))	1
30	0B60503A	Voltage Selector P C.B. (CR-2 (Other & Saudi Arabia))	1
L01	0E00868A	BT3x8 ⊕ Binding	10
L02	0E03212A	BT2.6x6 ⊕ Binding with Toothed Lock Washer)	3
L03	0E03433A	BT3x6 ⊕ Binding (Black Chromate)	6
L04	0E00857A	BT3x6 ⊕ Binding	2
L05	0E00921A	BT3x8 ⊕ Binding (Black Chromate)	1
L06	0E00985A	M3x6 ⊕ Binding (Black Chromate) (CR-2 (Australia), CR-2A, CR-2E & CR-20)	2
	0E00985A	M3x6 ⊕ Binding (Black Chromate) (CR-2 (Other & Saudi Arabia))	3
L07	0J05422A	Hole Plug	2
L08	0E03432A	BT3x6 ⊕ Tapping (Black Chromate)	7
L09	0E03438A	ST4x6 ⊕ Binding	2
L10	0E00859A	BT2.6x6 ⊕ Binding	1
L11	0E03437A	FT2.5x3.5 ⊕ Pan (Black Chromate)	2
L12	0E03375A	Nut Hex. M9	1
L13	0E03376A	Washer 9mm	1
L14	0E03382A	Nut Hex. M7	2
L15	0E03383A	Washer 7mm	2
L16	0F00846A	BT3x8 ⊕ Pan	2
—	0M05089A	Fuse Caution Label (CR-2A)	1

7.2. Chassis Ass'y (A01)

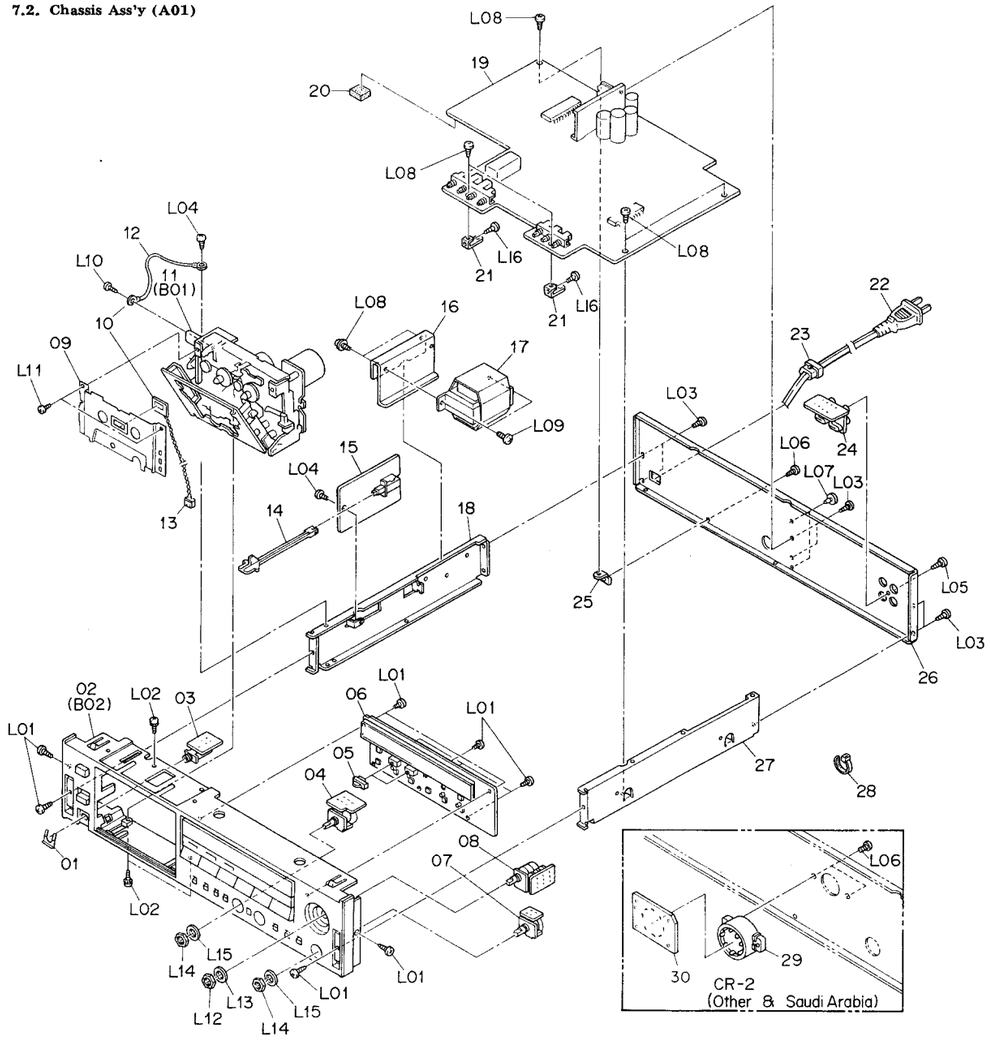


Fig. 7.2

7.3. Bottom Cover Ass'y (A02)

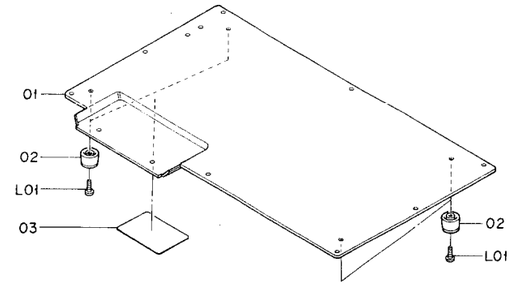


Fig. 7.3

Schematic Ref. No.	Part No.	Description	Q'ty
7.3. Bottom Cover Ass'y			
A02	JA04319A	Bottom Cover Ass'y (CR-2 & CR-2E)	1
	JA04329A	Bottom Cover Ass'y (CR-2A)	1
	JA04340A	Bottom Cover Ass'y (CR-20) Serial No.: A32501001 -	1
01	0J05401A	Bottom Cover	1
02	0J05420A	Leg N (CR-2, CR-2A & CR-2E)	4
	HA05357A	Leg Ass'y (CR-20)	4
03	0M04377B	Caution Label (CR-2A)	1
L01	0E00888A	BT3x12 ⊕ Binding	4
—	0J05461A	Leg Felt N (CR-2, CR-2A & CR-2E)	4

7.4. Mechanism Ass'y (B01)

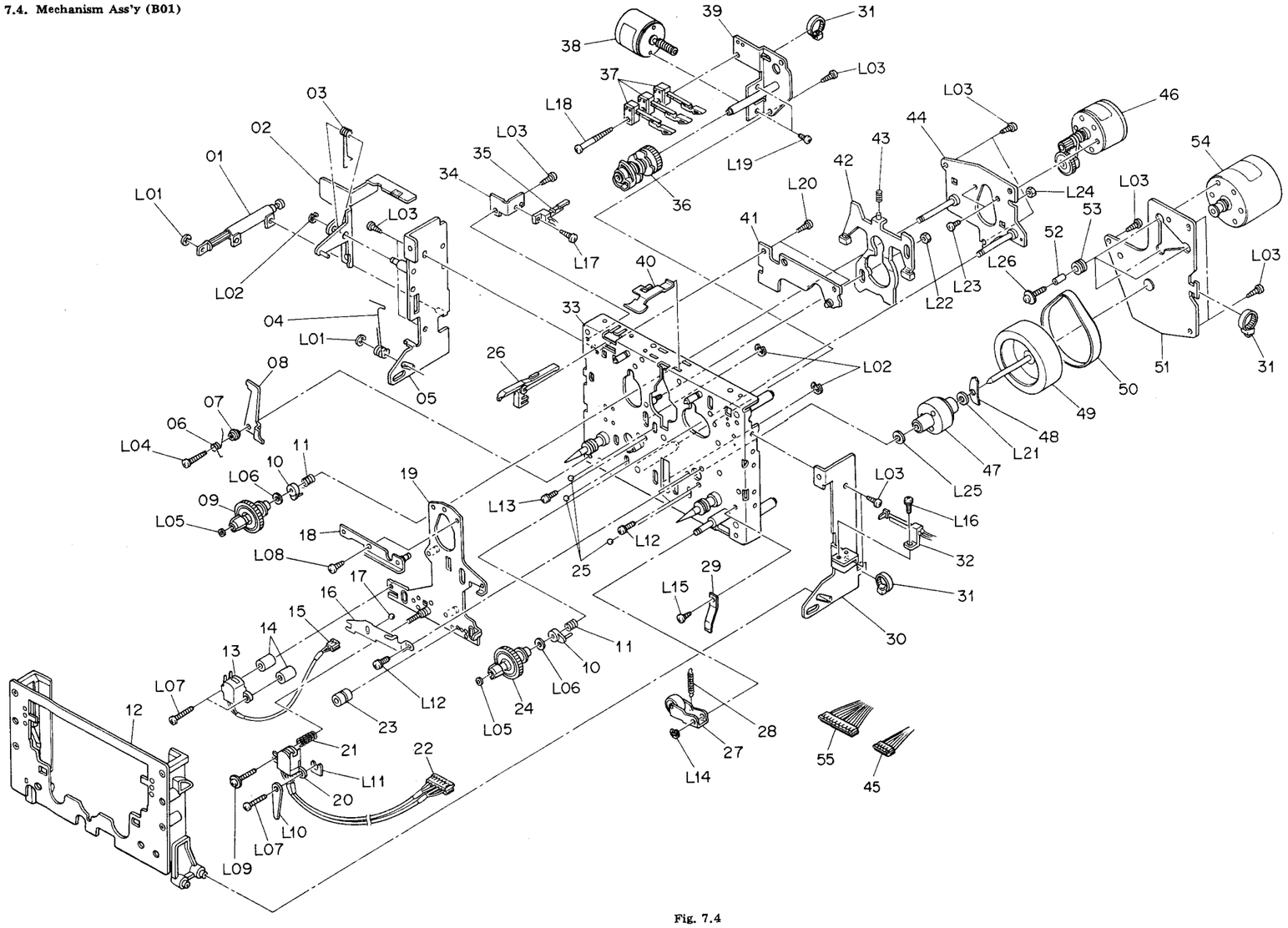


Fig. 7.4

Schematic Ref. No.	Part No.	Description	Q'ty
7.4. Mechanism Ass'y (B01)			
B01	**CA08886A**	**Mechanism Ass'y** **Serial No.: A32501001 -**	
01	CA80006A	Damper Ass'y	1
02	0C80021A	Eject Lever	1
03	0C82720A	Eject Lever Spring	1
04	0C80019B	Eject Spring	1
05	0C80018B	Cassette Case Holder L	1
06	0C80013A	Lock Lever Spring	1
07	0C80014A	Lock Lever Collar	1
08	0C82719A	Lock Lever B	1
09	CA80725A	Take-up Reel Hub Ass'y	1
10	0C80612A	Spring Holder	2
11	0C80613A	Reel Hub Spring	2
12	CA80001A	Cassette Case Ass'y	1
13	0G01365A	Erase Head E2D	1
14	0C80044A	Erase Head Collar	2
15	0C82704A	2P Connector for Erase Head	1
16	0C82710A	Head Base Hold Plate	1
17	0C80004A	Steel Ball 3mm	1
18	0C80005A	Reinforce Plate	1
19	0C82697A	Head Base B	1
20	0G01371A	Record/Playback Head 2G	1
21	0C82703A	Azimuth Adjust Spring	1
22	0C82705A	6P Connector for R/P Head	1
23	0C80045A	Record/Plaback Head Collar	1
24	CA80726A	Supply Reel Hub Ass'y	1
25	0C80007A	Steel Ball 2mm	3
26	0C80017B	Record Protector Lever	1
27	CA80005A	Pressure Rollar Ass'y	1
28	0C80008A	Pressure Roller Spring	1
29	0C80009A	Cassette Case Spring	1
30	0C80010D	Cassette Case Holder R	1
31	0C80037A	Insu-Lock	4
32	0C80012A	Eject Sensor Switch	1
33	0C82721A	Mechanism Chassis B	1
34	0C80025A	Record Protector Holder	1
35	0C80024A	Record Protector Switch	1
36	0C80026A	Cam	1
37	0C80027A	Mode Switch	3
38	CA80007A	Control Motor Ass'y	1
39	0C80028A	Control Motor Holder	1
40	0C82709A	Cassette Holder Spring	1
41	CA80011A	Shut-off P.C.B. Ass'y	1
42	CA80204A	Brake Ass'y B	1
43	0C80628A	Brake Spring	1
44	0C82722A	Reel Motor Holder B	1
45	0C82707A	5P Connector	1
46	CA80728A	Reel Motor Ass'y	1
47	0C80031A	Capstan Flange	1
48	0C80029A	Back Tension Spring	1
49	0C80033A	Flywheel	1
50	0C80034A	Capstan Belt	1
51	CA80009A	Flywheel Holder Ass'y	1
52	0C80035A	Sleeve	3
53	0C80036A	Floating Rubber	3
54	CA80010A	Capstan Motor Ass'y	1
55	0C82706A	9P Connector	1
L01	0E03052A	CS Stopper 2.4mm	2
L02	0E00181A	E-Ring 3mm	3
L03	0E03042A	FT2.5x5 ⊕Pan	11
L04	0E03043A	FT2.5x10 ⊕Pan	1
L05	0E03049A	Washer 1.8x3.2x0.5	2
L06	0E03226A	Washer 2.1x4.5x0.1	2
L07	0E03038A	M2x12 ⊕Binding	3
L08	0E03040A	FT2.5x3.5 ⊕Pan	1
L09	0E03436A	TP2x6	1
L10	0E03053A	Wire Holder	1
L11	0C80038A	Shim 0.06T	1
	0C80039A	Shim 0.1T	1
	0C80048A	Shim 0.03T	1
L12	0E03046A	M2.6x6 ⊕Pan (2A)	3
L13	0E03036A	M2x4 ⊕Pan (2A)	1
L14	0E00222A	E-Ring 2mm	1
L15	0E03035A	M2x3.2 ⊕Truss	1
L16	0E03037A	M2x5 ⊕Pan (2A)	1
L17	0E03048A	FT2.6x6 ⊕Pan	1
L18	0E03044A	FT2.5x20 ⊕Pan	1
L19	0E00691A	M2x3 ⊕Pan	2
L20	0E03041A	FT2.5x4 ⊕Pan	2
L21	0E03245A	Plastic Washer 1.3x3.3x0.3	1
L22	0E03237A	Nut Hex. M2.6	1
L23	0E03045A	M2.6x3 ⊕Binding	2
L24	0E00694A	Nut Hex. M2	1
L25	0E03051A	Washer 2.5x7x0.8	1
L26	0E03047A	M2.6x9 ⊕Pan	3

7.5 Front Escutcheon Ass'y (B02)

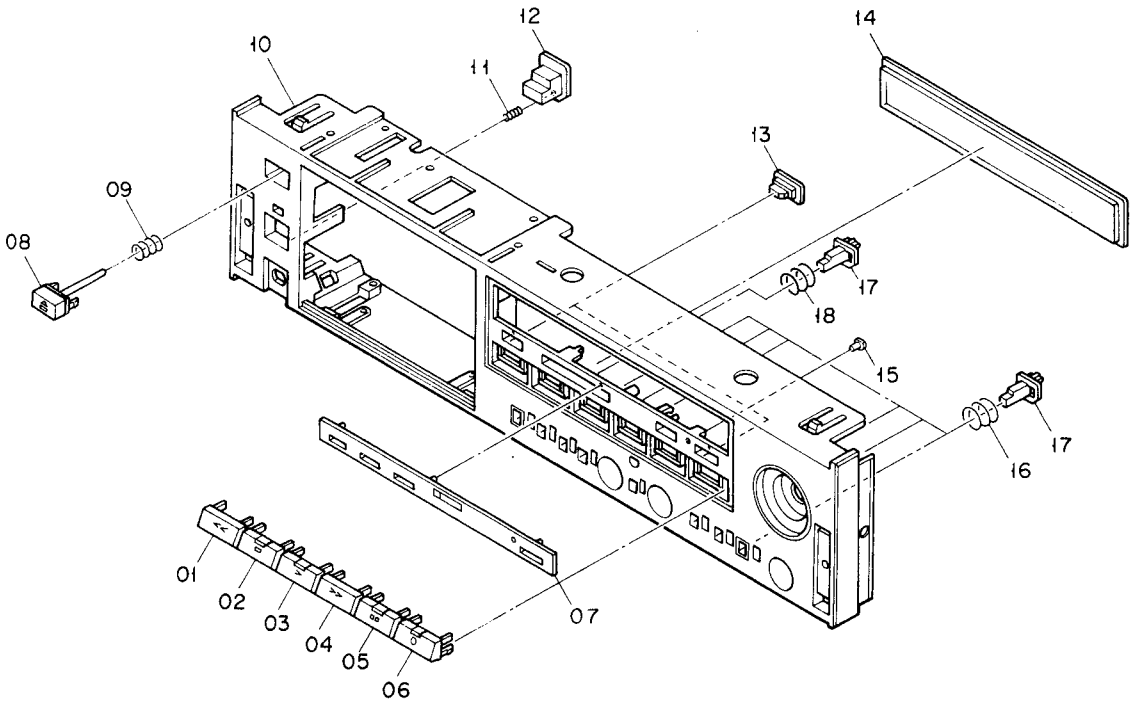


Fig. 7.5

Schematic Ref. No.	Part No.	Description	Q'ty
7.5. Front Escutcheon Ass'y (B02)			
B02	**HA05308A**	**Front Escutcheon Ass'y** Serial No.: A32501001 -	**1**
01	0H05126A	Rewind Button	1
02	HA05359A	Stop Button Ass'y	1
03	HA05343A	Play Button Ass'y	1
04	0H05129A	F.F. Button	1
05	HA05361A	Pause Button Ass'y	1
06	HA05360A	Rec. Button Ass'y	1
07	0H05100B	Function Plate	1
08	HA05344A	Eject Button Ass'y	1
09	0J05404A	Eject Spring	1
10	0H05122B	Front Escutcheon	1
11	0J05405A	Power Switch Spring	1
12	0H05125B	Power Switch Knob	1
13	0H05094A	Function Button	2
14	0H05101A	Display Lens	1
15	0H05103A	LED Lens B	1
16	0J05406A	Push Switch Spring	6
17	0H05097A	Push Button	7
18	0J05452B	EX Switch Spring	1
—	0J05458B	LED Lens Adhesive Tape	2
—	0J05459A	F. Plate Adhesive Tape	2

8. MOUNTING DIAGRAMS AND PARTS LIST

Notes: 1. Mounting diagram shows a dip side view of the printed circuit board.
2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
3. Following transistors are interchangeable with each other.
   a. 2SA733, 2SA608SP, 2SA1048, 2SA1175
   b. 2SC945, 2SC536SP, 2SC2458, 2SC2785
4. Abbreviation for part name:
   TR — Transistor, SiD — Silicon Diode, ZD — Zener Diode
   RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor
   CE — Electrolytic Capacitor, CML — Mylar Capacitor, CC — Ceramic Capacitor, CPP — PP Capacitor, CMM — Metalized Mylar Capacitor, CSP — Polystyrene Capacitor, C — Mica Capacitor

8.1. Fuse P.C.B. Ass'y

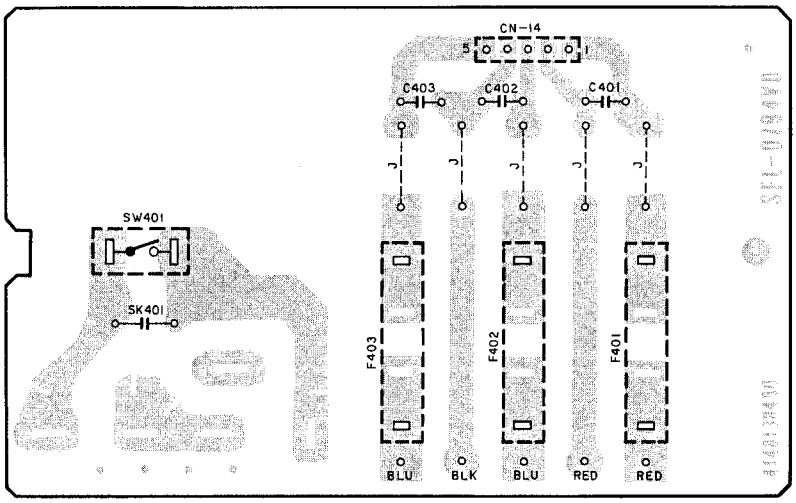


Fig. 8.1

8.2. Pin Jack P.C.B. Ass'y

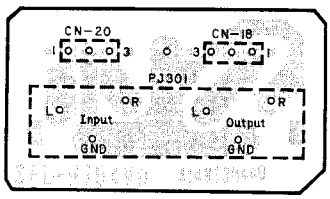


Fig. 8.2

8.3. Input Volume P.C.B. Ass'y

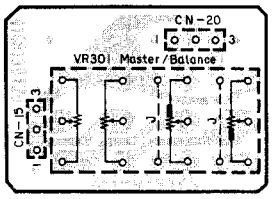


Fig. 8.3

Schematic Ref. No.	Part No.	Description
8.1. Fuse P.C.B. Ass'y		
	BA06964A	Fuse P.C.B. Ass'y (CR-2 & CR-2E)
	BA06963A	Fuse P.C.B. Ass'y (CR-2A)
	BA06965A	Fuse P.C.B. Ass'y (CR-20)
	0B60502A	Fuse P.C.B.
C401,402	0B09292A	CC 0.1μ 50V Z
C403	0B09292A	CC 0.1μ 50V Z
F401	0B90287A	Fuse T800mA (CR-2 & CR-2E)
F401	0B90286A	Fuse 1.0A (CR-2A)
F401	0B90290A	Fuse 1A (CR-20)
F402,403	0B90289A	Fuse T1A (CR-2 & CR-2E)
F402,403	0B90285A	Fuse 1.6A (CR-2A)
F402,403	0B90291A	Fuse 1.6A (CR-20)
SK401	0B41829A	CC 4700P 400V (CR-2, CR-2A & CR-2E))
SK401	0B41826A	CC 4700P 250V (CR-20)
CN14	0B83161A	5P Connector
SW401	0B71006A	Power Switch SDL1P (1)
	0B08349B	Fuse ClIP (6)
	0M04131B	Fuse Label T1A 250Vx2 (CR-2 & CR-2E) (1)
	0M05082A	Fuse Label T800mA 250V (CR-2 & CR-2E) (1)
	0B81776A	Contact Pin (CR-2 & CR-2E) (5)
8.2. Pin Jack P.C.B. Ass y		
	BA06970A	Pin Jack P.C.B. Ass'y
	0B60497A	Pin Jack P.C.B.
PJ301	0B81755A	4P Pin Jack
CN20	0W19300A	Wire 2791 24 300 WHT with Shrink Tube
8.3. Input Volume P.C.B. Ass'y		
	BA06966A	Input Volume P.C.B. Ass'y
	0B60498A	Input Volume P.C.B
VR301	0B30077A	Volume 100KAx2
	0J05419A	Volume Ground Plate (1)
	0V10050C	Wire 1007 26 Twisted 52 BLK C (1)

8.4. Output Volume P.C.B. Ass'y

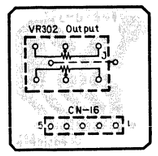


Fig. 8.4

8.5. Headphone P.C.B. Ass'y

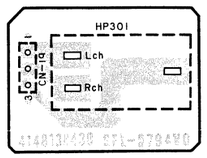


Fig. 8.5

8.6. Bias Tune Volume P.C.B. Ass'y

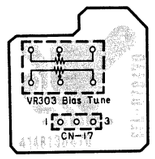


Fig. 8.6

8.7. Shut-off P.C.B. Ass'y

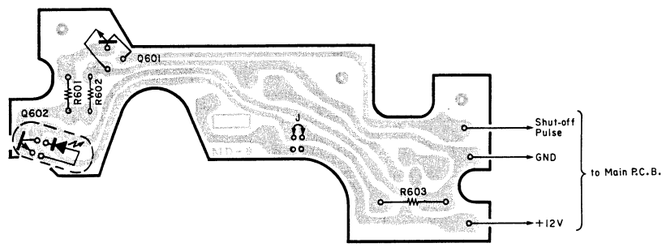


Fig. 8.7

Schematic Ref. No.	Part No.	Description
8.4. Output Volume P.C.B. Ass'y		
	BA06967A	**Output Volume P.C.B. Ass'y**
	0B60499A	Output Volume P.C.B
VR302	0B30078A	Volume 10KAx2
	0J05419A	Volume Ground Plate (1)
	0V10050C	Wire 1007 26 Twisted 52 BLK C (1)
8.5. Headphone P.C.B. Ass'y		
	BA06969A	**Headphone P.C.B. Ass'y**
	0B60501A	Headphone P.C.B.
HP301	0B81757A	Headphone Jack

Schematic Ref. No.	Part No.	Description
8.6. Bias Tune Volume P.C.B. Ass'y		
	BA06968A	**Bias Tune Volume P.C.B. Ass'y**
	0B60500A	Bias Tune Volume P.C.B.
VR303	0B30079A	Volume 100KAx2
	0J05419A	Volume Ground Plate (1)
	0V10050C	Wire 1007 26 Twisted 52 BLK C (1)
8.7. Shut-off P.C.B. Ass'y		
	CA80011A	**Shut-off P.C.B. Ass'y**
	0C80047A	Shut-off P.C.B.
Q601	0B06388A	TR 2SC2812
Q602	0B06389A	Photo Reflector NJL5141
R601	0B09840A	RK 680
R602	0B09841A	RK 15K
R603	0C81330A	RM 750
	0C81334A	0V13130N
	0C81335A	0V10115N

8.8. Control P.C.B. Ass'y

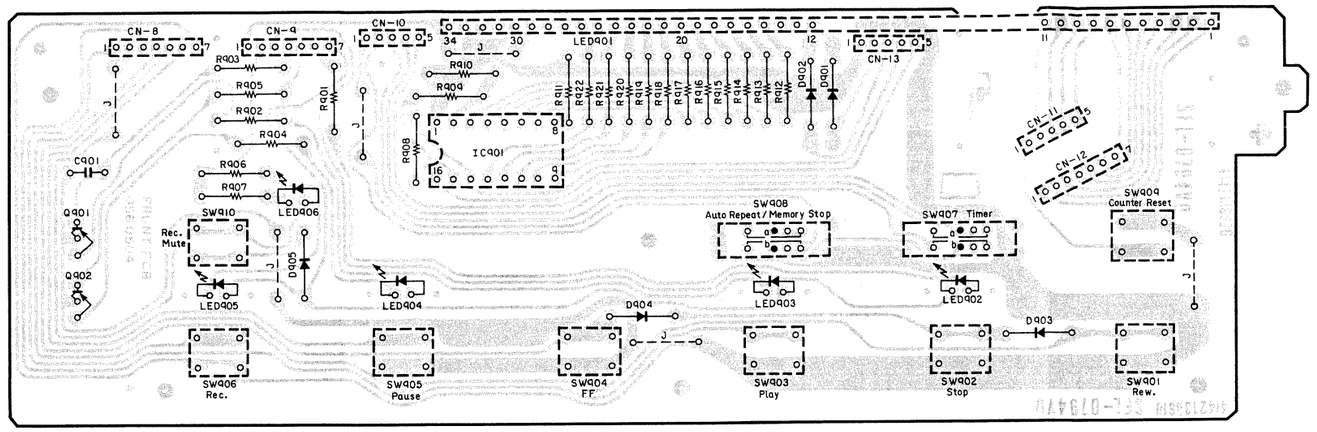


Fig. 8.8

Schematic Ref. No.	Part No.	Description
8.8. Control P.C.B. Ass'y		
	BA06961A	**Control P.C.B. Ass'y**
	0B60504A	Control P.C.B.
IC901	0B06369A	IC TA7612AP
Q901,902	0B06013A	TR 2SA733 (P,Q)
D901,902	0B12584A	SiD 1N4148
D903,904	0B12584A	SiD 1N4148
D905	0B12584A	SiD 1N4148
LED901	0B12575A	Display Unit SL-7663-03
LED902,903	0B12578A	LED SLR-34PC4F
LED904	0B12578A	LED SLR-34PC4F
LED905	0B12577A	LED SLR-34DC4F
LED906	0B12579A	LED SLR-320DC4F
R901	0B05578A	RK 180 1/4W J
R902	0B09797A	RK 120 1/4W J
R903	0B01846A	RK 4.7K 1/4W J
R904	0B09797A	RK 120 1/4W J
R905	0B01846A	RK 4.7K 1/4W J
R906	0B20416A	RK 110 1/4W J
R907	0B01706A	RK 47 1/4W J
R908	0B09314A	RK 5.1K 1/4W J
R909	0B01857A	RK 1K 1/4W J
R910	0B20430A	RK 160 1/4W J
R911	0B01888A	RK 10K 1/4W J
R912	0B05795A	RK 150 1/4W J
R913,914	0B01679A	RK 100 1/4W J
R915,916	0B01679A	RK 100 1/4W J
R917,918	0B01679A	RK 100 1/4W J
R919,920	0B01679A	RK 100 1/4W J
R921,922	0B01679A	RK 100 1/4W J
C901	0B05557A	CML 0.015μ 50V J
SW901,902	0B70043A	Tact Switch SKHHPM
SW903,904	0B70043A	Tact Switch SKHHPM
SW905,906	0B70043A	Tact Switch SKHHPM
SW907,908	0B07437A	Slide Switch ESD-14150
SW909,910	0B70043A	Tact Switch SKHHPM
CN8	0B83155A	7P Connector
CN9	0B83156A	7P Connector
CN10	0B83157A	5P Connector
CN11	0B83159A	5P Connector
CN12	0B83160A	7P Connector
CN13	0B83158A	5P Connector
	0J05416A	LED Reflector (4)

8.9. Main P.C.B. Ass'y

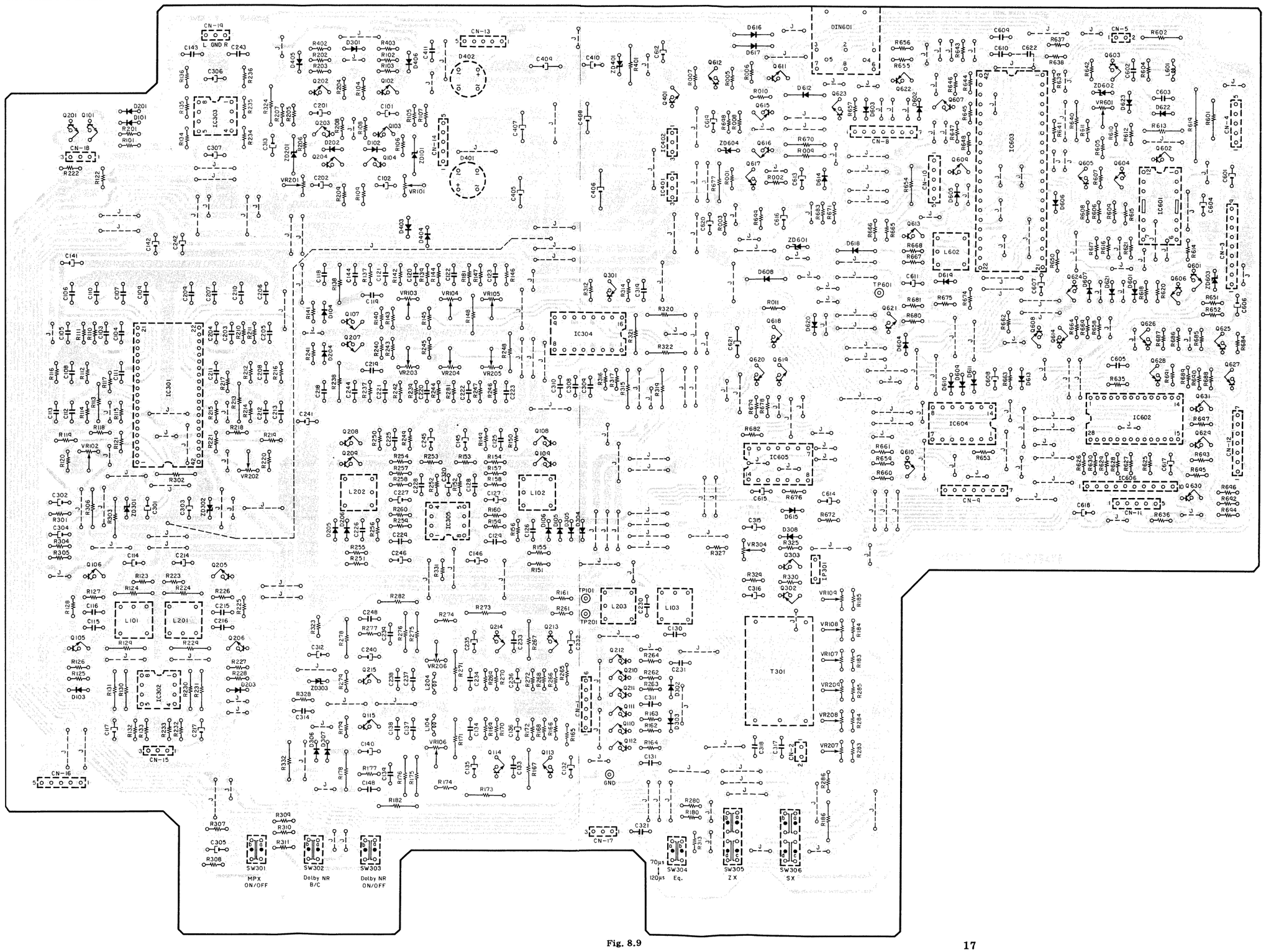


Fig. 8.9

8.9. Main P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BA06947A	**Main P.C.B. Ass'y**
	— PB Eq. Amp. —	
Q110,111	0B06142A	TR 2SC2240 (BL)
Q112	0B01872A	TR 2SC945L (P,Q)
Q113,114	0B06142A	TR 2SC2240 (BL)
Q115	0B01872A	TR 2SC945L (P,Q)
Q210,211	0B06142A	TR 2SC2240 (BL)
Q212	0B01872A	TR 2SC945L (P,Q)
Q213,214	0B06142A	TR 2SC2240 (BL)
Q215	0B01872A	TR 2SC945L (P,Q)
ZD303	0B12168A	ZD 10V RD10JS-T1B2
D302,303	0B06398A	SiD 1SS176
D306,307	0B06398A	SiD 1SS176
L104	0B51264A	Inductor 36mH
L204	0B51264A	Inductor 36mH
VR106	0B32125A	Semi VR 2K
VR206	0B32125A	Semi VR 2K
R162,163	0B09695A	RK 5.6K 1/6W J
R164	0B09695A	RK 5.6K 1/6W J
R165	0B09629A	RK 10 1/6W J
R166	0B09741A	RK 470K 1/6W J
R167	0B09330A	RK 100K 1/4W J
R168	0B09651A	RK 82 1/6W J
R169	0B09711A	RK 27K 1/6W J
R170	0B09731A	RK 180K 1/6W J
R171	0B09432A	RM 8.25K 1/4W F
R172	0B09685A	RK 2.2K 1/6W J
R173	0B09330A	RK 100K 1/4W J
R174	0B09655A	RK 120 1/6W J
R175	0B22758A	RM 14.0K 1/4W F
R176	0B09534A	RM 12.7K 1/4W F
R177	0B09749A	RK 1M 1/6W J
R178	0B22416A	RM 44.2K 1/6W F
R179	0B09703A	RK 12K 1/6W J
R182	0B22416A	RM 44.2K 1/6W F
R262,263	0B09695A	RK 5.6K 1/6W J
R264	0B09695A	RK 5.6K 1/6W J
R265	0B09629A	RK 10 1/6W J
R266	0B09741A	RK 470K 1/6W J
R267	0B09330A	RK 100K 1/4W J
R268	0B09651A	RK 82 1/6W J
R269	0B09725A	RK 100K 1/6W J
R270	0B09731A	RK 180K 1/6W J
R271	0B09432A	RM 8.25K 1/4W F
R272	0B09685A	RK 2.2K 1/6W J
R273	0B09330A	RK 100K 1/4W J
R274	0B09655A	RK 120 1/6W J
R275	0B22758A	RM 14.0K 1/4W F
R276	0B09534A	RM 12.7K 1/4W F
R277	0B09749A	RK 1M 1/6W J
R278	0B22416A	RM 44.2K 1/6W F
R279	0B09703A	RK 12K 1/6W J
R282	0B22416A	RM 44.2K 1/6W F
R323	0B09677A	RK 1K 1/6W J
R328	0B09725A	RK 100K 1/6W J
R332	0B01889A	RK 100K 1/4W J
C131	0B09282A	CC 100P 50V K
C132	0B09137A	CE 22μ 25V
C133	0B09283A	CC 220P 50V K
C134	0B05832A	CML 0.018μ 50V J
C135	0B01863A	CE 3.3μ 50V
C136	0B01403A	CE 47μ 16V
C137	0B41002A	CPP 390P 100V J
C138	0B05550A	CML 1000P 50V J
C139	0B05530A	CML 6800P 50V J
C140	0B09332A	CE 2.2μ 50V (LN)
C148	0B09270A	CPP 470P 100V J
C231	0B09282A	CC 100P 50V K
C232	0B09137A	CE 22μ 25V
C233	0B09283A	CC 220P 50V K
C234	0B05832A	CML 0.018μ 50V J
C235	0B01863A	CE 3.3μ 50V
C236	0B01403A	CE 47μ 16V
C237	0B41002A	CPP 390P 100V J
C238	0B05550A	CML 1000P 50V J
C239	0B05530A	CML 6800P 50V J
C240	0B09332A	CE 2.2μ 50V (LN)
C248	0B09270A	CPP 470P 100V J
C311	0B09282A	CC 100P 50V K
C312	0B01400A	CE 100μ 16V
C314	0B01780A	CML 0.1μ 50V J
CN1	0B81763A	6P-T Post

Schematic Ref. No.	Part No.	Description
	— Dolby NR —	
IC301	0B11363A	IC CX20188
ZD301,302	0B12168A	ZD 10V RD10JS-T1B2
VR102	0B32126A	Semi VR 5K
VR202	0B32126A	Semi VR 5K
R110	0B09673A	RK 680 1/6W J
R111	0B09700A	RK 9.1K 1/6W J
R112	0B09698A	RK 7.5K 1/6W J
R113	0B22380A	RM 22.1K 1/6W F
R114	0B22201A	RM 562 1/6W F
R115	0B22294A	RM 3.83K 1/6W F
R116	0B22285A	RM 3.24K 1/6W F
R117	0B09749A	RK 1M 1/6W J
R118	0B22716A	RM 9.09K 1/4W F
R119	0B09707A	RK 18K 1/6W J
R120	0B09681A	RK 1.5K 1/6W J
R121	0B22229A	RM 1.00K 1/6W F
R210	0B09673A	RK 680 1/6W J
R211	0B09700A	RK 9.1K 1/6W J
R212	0B09698A	RK 7.5K 1/6W J
R213	0B22380A	RM 22.1K 1/6W F
R214	0B22201A	RM 562 1/6W F
R215	0B22294A	RM 3.83K 1/6W F
R216	0B22285A	RM 3.24K 1/6W F
R217	0B09749A	RK 1M 1/6W J
R218	0B22716A	RM 9.09K 1/4W F
R219	0B09707A	RK 18K 1/6W J
R220	0B09681A	RK 1.5K 1/6W J
R221	0B22229A	RM 1.00K 1/6W F
R301	0B09709A	RK 22K 1/6W J
R302	0B09466A	RM 130K 1/4W F
R303	0B24146A	RF 62 1/4W J
R304,305	0B09701A	RK 10K 1/6W J
R306	0B24146A	RF 62 1/4W J
C103	0B05681A	CML 0.01μ 50V J
C104	0B41143A	CPP 5600P 100V G
C105	0B05813A	CML 0.056μ 50V J
C106	0B05682A	CML 0.068μ 50V J
C107	0B09872A	CMM 0.22μ 50V J
C108	0B05557A	CML 0.015μ 50V J
C109	0B09870A	CMM 0.15μ 50V J
C110	0B09876A	CMM 0.47μ 50V J
C111	0B41139A	CPP 3900P 100V G
C112,113	0B41133A	CPP 2200P 100V G
C141,142	0B01674A	CE 10μ 25V
C203	0B05681A	CML 0.01μ 50V J
C204	0B41143A	CPP 5600P 100V G
C205	0B05813A	CML 0.056μ 50V J
C206	0B05682A	CML 0.068μ 50V J
C207	0B09872A	CMM 0.22μ 50V J
C208	0B05557A	CML 0.015μ 50V J
C209	0B09870A	CMM 0.15μ 50V J
C210	0B09876A	CMM 0.47μ 50V J
C211	0B41139A	CPP 3900P 100V G
C212,213	0B41133A	CPP 2200P 100V G
C241,242	0B01674A	CE 10μ 25V
C301	0B01391A	CE 220μ 25V
C302	0B01402A	CE 4.7μ 25V
C303	0B01391A	CE 220μ 25V
C304	0B01409A	CE 47μ 25V
	— Input Amp. —	
IC302	0B06146A	IC NJM4558DD
Q105,106	0B01872A	TR 2SC945L(P,Q)
Q205,206	0B01872A	TR 2SC945L(P,Q)
D103	0B06398A	SiD 1SS176
D203	0B06398A	SiD 1SS176
L101	0B51262A	L-C Block Blu (MPX)
L201	0B51262A	L-C Block Blu (MPX)
R123	0B09709A	RK 22K 1/6W J
R124	0B22551A	RM 7.68K 1/4W F
R125	0B09689A	RK 3.3K 1/6W J
R126,127	0B09749A	RK 1M 1/6W J
R128	0B09689A	RK 3.3K 1/6W J
R129	0B09421A	RM 2.67K 1/4W F
R130	0B09424A	RM 4.75K 1/4W F
R131	0B09203A	RM 10K 1/4W F
R132	0B09653A	RK 100 1/6W J
R133	0B09725A	RK 100K 1/6W J
R223	0B09709A	RK 22K 1/6W J
R224	0B22551A	RM 7.68K 1/4W F
R225	0B09689A	RK 3.3K 1/6W J
R226,227	0B09749A	RK 1M 1/6W J
R228	0B09689A	RK 3.3K 1/6W J
R229	0B09421A	RM 2.67K 1/4W F

Schematic Ref. No.	Part No.	Description
R230	0B09424A	RM 4.75K 1/4W F
R231	0B09203A	RM 10K 1/4W F
R232	0B09653A	RK 100 1/6W J
R233	0B09725A	RK 100K 1/6W J
C114	0B09332A	CE 2.2μ 50V (LN)
C115	0B05687A	CML 1200P 50V J
C116	0B09189A	CML 2700P 50V J
C117	0B09223A	CE 1μ 50V (LN)
C214	0B09332A	CE 2.2μ 50V (LN)
C215	0B05687A	CML 1200P 50V J
C216	0B09189A	CML 2700P 50V J
C217	0B09223A	CE 1μ 50V (LN)
	— Rec. Level —	
IC304	0B11027A	IC TC9145P
Q107	0B01872A	TR 2SC945L (P,Q)
Q207	0B01872A	TR 2SC945L (P,Q)
Q301	0B06013A	TR 2SA733 (P,Q)
D104	0B06398A	SiD 1SS176
D204	0B06398A	SiD 1SS176
VR103,104	0B32127A	Semi VR 10K
VR105	0B32128A	Semi VR 20K
VR203,204	0B32127A	Semi VR 10K
VR205	0B32128A	Semi VR 20K
R137	0B09705A	RK 15K 1/6W J
R138	0B09577A	RM 7.15K 1/4W F
R139	0B09689A	RK 3.3K 1/6W J
R140	0B09749A	RK 1M 1/6W J
R141	0B09697A	RK 6.8K 1/6W J
R142	0B09707A	RK 18K 1/6W J
R143	0B09687A	RK 2.7K 1/6W J
R144	0B09701A	RK 10K 1/6W J
R145	0B09687A	RK 2.7K 1/6W J
R146	0B09693A	RK 4.7K 1/6W J
R147	0B09705A	RK 15K 1/6W J
R148	0B01846A	RK 4.7K 1/4W J
R181	0B09677A	RK 1K 1/6W J
R237	0B09705A	RK 15K 1/6W J
R238	0B09577A	RM 7.15K 1/4W F
R239	0B09689A	RK 3.3K 1/6W J
R240	0B09749A	RK 1M 1/6W J
R241	0B09697A	RK 6.8K 1/6W J
R242	0B09707A	RK 18K 1/6W J
R243	0B09687A	RK 2.7K 1/6W J
R244	0B09701A	RK 10K 1/6W J
R245	0B09687A	RK 2.7K 1/6W J
R246	0B09693A	RK 4.7K 1/6W J
R247	0B09705A	RK 15K 1/6W J
R248	0B01846A	RK 4.7K 1/4W J
R281	0B09677A	RK 1K 1/6W J
R312	0B09725A	RK 100K 1/6W J
R314	0B09725A	RK 100K 1/6W J
R315	0B05625A	RK 220K 1/4W J
R316,317	0B09733A	RK 220K 1/6W J
R319	0B05626A	RK 150K 1/4W J
R320	0B05622A	RK 2.2K 1/4W J
R321	0B01681A	RK 3.3K 1/4W J
R322	0B05622A	RK 2.2K 1/4W J
C118	0B09783A	CPP 820P 100V J
C119	0B05814A	CML 8200P 50V J
C120	0B09189A	CML 2700P 50V J
C121	0B05550A	CML 1000P 50V J
C122	0B05814A	CML 8200P 50V J
C123	0B05659A	CML 5600P 50V J
C144	0B09323A	CPP 560P 100V J
C218	0B09783A	CPP 820P 100V J
C219	0B05814A	CML 8200P 50V J
C220	0B09189A	CML 2700P 50V J
C221	0B05550A	CML 1000P 50V J
C222	0B05814A	CML 8200P 50V J
C223	0B05659A	CML 5600P 50V J
C244	0B09323A	CPP 560P 100V J
C308,309	0B05681A	CML 0.01μ 50V J
C310	0B05681A	CML 0.01μ 50V J
C319	0B05550A	CML 1000P 50V J
	— Rec. Amp. —	
IC305	0B06387A	IC NJM2043DD
Q108	0B06299A	TR 2SC2878
Q109	0B01872A	TR 2SC945L (P,Q)
Q208	0B06299A	TR 2SC2878
Q209	0B01872A	TR 2SC945L (P,Q)
D105,106	0B06398A	SiD 1SS176
D205,206	0B06398A	SiD 1SS176
D304,305	0B06398A	SiD 1SS176
L102	0B51259A	Trap Coil 10.5mH

Schematic Ref. No.	Part No.	Description
L103	0B51257A	L-C Block TF10 42-1274
L202	0B51259A	Trap Coil 10.5mH
L203	0B51257A	L-C Block TF10 42-1274
R149	0B09711A	RK 27K 1/6W J
R150	0B09719A	RK 56K 1/6W J
R151	0B09703A	RK 12K 1/6W J
R152	0B09677A	RK 1K 1/6W J
R153	0B09741A	RK 470K 1/6W J
R154	0B09671A	RK 560 1/6W J
R155	0B09705A	RK 15K 1/6W J
R156	0B09669A	RK 470 1/6W J
R157	0B09691A	RK 3.9K 1/6W J
R158	0B09689A	RK 3.3K 1/6W J
R159	0B09719A	RK 56K 1/6W J
R160	0B09735A	RK 270K 1/6W J
R161	0B09697A	RK 6.8K 1/6W J
R249	0B09711A	RK 27K 1/6W J
R250	0B09719A	RK 56K 1/6W J
R251	0B09703A	RK 12K 1/6W J
R252	0B09677A	RK 1K 1/6W J
R253	0B09741A	RK 470K 1/6W J
R254	0B09671A	RK 560 1/6W J
R255	0B09705A	RK 15K 1/6W J
R256	0B09669A	RK 470 1/6W J
R257	0B09691A	RK 3.9K 1/6W J
R258	0B09689A	RK 3.3K 1/6W J
R259	0B09719A	RK 56K 1/6W J
R260	0B09735A	RK 270K 1/6W J
R261	0B09697A	RK 6.8K 1/6W J
R331	0B09663A	RK 270 1/6W J
C125	0B01804A	CML 3900P 50V J
C126	0B05659A	CML 5600P 50V J
C127	0B09218A	CE 47μ 16V (LN)
C128	0B01802A	CML 2200P 50V J
C129	0B05796A	CML 0.047μ 50V J
C130	0B09280A	CC 47P 50V J
C145	0B01405A	CE 1μ 50V
C146	0B01412A	CE 10μ 16V
C225	0B01804A	CML 3900P 50V J
C226	0B05659A	CML 5600P 50V J
C227	0B09218A	CE 47μ 16V (LN)
C228	0B01802A	CML 2200P 50V J
C229	0B05796A	CML 0.047μ 50V J
C230	0B09280A	CC 47P 50V J
C245	0B01405A	CE 1μ 50V
C246	0B01412A	CE 10μ 16V
C320	0B01403A	CE 47μ 16V
	— Meter Amp. —	
Q102	0B01872A	TR 2SC945L (P,Q)
Q103,104	0B10034A	TR 2SC1740S
Q202	0B01872A	TR 2SC945L (P,Q)
Q203,204	0B10034A	TR 2SC1740S
ZD101	0B06230A	ZD 5.1V RD5.1EB2
ZD201	0B06230A	ZD 5.1V RD5.1EB2
D102	0B06398A	SiD 1SS176
D202	0B06398A	SiD 1SS176
D301	0B06398A	SiD 1SS176
D405,406	0B06398A	SiD 1SS176
VR101	0B32130A	Semi VR 100K
VR201	0B32130A	Semi VR 100K
R102	0B09725A	RK 100K 1/6W J
R103	0B09719A	RK 56K 1/6W J
R104,105	0B09725A	RK 100K 1/6W J
R106	0B09743A	RK 560K 1/6W J
R107	0B09729A	RK 150K 1/6W J
R108	0B09725A	RK 100K 1/6W J
R109	0B09713A	RK 33K 1/6W J
R202	0B09725A	RK 100K 1/6W J
R203	0B09719A	RK 56K 1/6W J
R204,205	0B09725A	RK 100K 1/6W J
R206	0B09743A	RK 560K 1/6W J
R207	0B09729A	RK 150K 1/6W J
R208	0B09725A	RK 100K 1/6W J
R209	0B09713A	RK 33K 1/6W J
R324	0B09216A	RF 10 1/4W J
R402,403	0B09719A	RK 56K 1/6W J
C101	0B09148A	CE 10μ 25V (LN)
C102	0B09394A	CE 0.15μ 50V (LN)
C201	0B09148A	CE 10μ 25V (LN)
C202	0B09394A	CE 0.15μ 50V (LN)
C313	0B01400A	CE 100μ 16V

Schematic Ref. No.	Part No.	Description
	— Headphone Amp. —	
IC303	0B06370A	IC 4556D
R134	0B09717A	RK 47K 1/6W J
R135	0B09701A	RK 10K 1/6W J
R136	0B05579A	RK 22 1/4W J
R234	0B09717A	RK 47K 1/6W J
R235	0B09701A	RK 10K 1/6W J
R236	0B05579A	RK 22 1/4W J
C143	0B05582A	CML 0.022μ 50V J
C243	0B05582A	CML 0.022μ 50V J
C306,307	0B01400A	CE 100μ 16V
	— Bias Osc. —	
IP301	0B11335A	IC Protector ICP-N15-T104
Q302	0B06069A	TR 2SB564 (L,M)
Q303	0B06299A	TR 2SC2878
D308	0B06398A	SiD 1SS176
T301	0B51255A	Bias Osc. Unit
VR107,108	0B32128A	Semi VR 20KB
VR109	0B32128A	Semi VR 20KB
VR207,208	0B32128A	Semi VR 20KB
VR209	0B32128A	Semi VR 20KB
VR304	0B32126A	Semi VR 5K
R180	0B09701A	RK 10K 1/6W J
R183	0B09653A	RK 100 1/6W J
R184	0B09695A	RK 5.6K 1/6W J
R185	0B09703A	RK 12K 1/6W J
R186	0B09705A	RK 15K 1/6W J
R280	0B09701A	RK 10K 1/6W J
R283	0B09653A	RK 100 1/6W J
R284	0B09695A	RK 5.6K 1/6W J
R285	0B09703A	RK 12K 1/6W J
R286	0B09705A	RK 15K 1/6W J
R325	0B09670A	RK 510 1/6W J
R327	0B09705A	RK 15K 1/6W J
R329	0B01683A	RK 15K 1/4W J
R330	0B09701A	RK 10K 1/6W J
C315	0B01674A	CE 10μ 25V
C316	0B01405A	CE 1μ 50V
C317	0B09828A	CPP 8200P 100V J
C318	0B41229A	CPP 1500P 100V J
CN2	0B81759A	2P-T Post
	— Switch —	
Q101	0B06299A	TR 2SC2878
Q201	0B06299A	TR 2SC2878
D101	0B06398A	SiD 1SS176
D201	0B06398A	SiD 1SS176
R101	0B09697A	RK 6.8K 1/6W J
R122	0B09685A	RK 2.2K 1/6W J
R201	0B09697A	RK 6.8K 1/6W J
R222	0B09685A	RK 2.2K 1/6W J
R307,308	0B09683A	RK 1.8K 1/6W J
R309	0B09689A	RK 3.3K 1/6W J
R310,311	0B09673A	RK 680 1/6W J
R313	0B09733A	RK 220K 1/6W J
C305	0B01402A	CE 4.7μ 25V
C321	0B09292A	CC 0.1μ 50V J
SW301,302 303	0B70113A	Push Switch SPUJ32
SW304,305 306	0B70114A	Push Switch SPUJ42
	— DC Supply —	
IC401	0B06380A	IC NJM7812
IC402	0B11029A	IC NJM7912
Q401	0B06452A	TR 2SD1406 (Y)
ZD401	0B12150A	ZD 5.6V RD5.6JS-T1B2
D401,402	0B12585A	SiD WL01
D403,404	0B06398A	SiD 1SS176
R401	0B09914A	RF 330 1/2W J
C405	0B40197A	CE 4700μ 25V
C406	0B40362A	CE 6800μ 16V
C407	0B40363A	CE 2200μ 25V
C408	0B40361A	CE 2200μ 16V
C409	0B09377A	CE 4700μ 16V
C410	0B01403A	CE 47μ 16V
C411	0B09283A	CC 220P 50V J
CN13,14	0B81762A	5P-T Post
	0J05415A	Heat Sink (1)
	0E00868A	BT3x8 ⊕ Binding (2)
	0E00985A	BT3x6 ⊕ Binding (Black Chromate)(3)

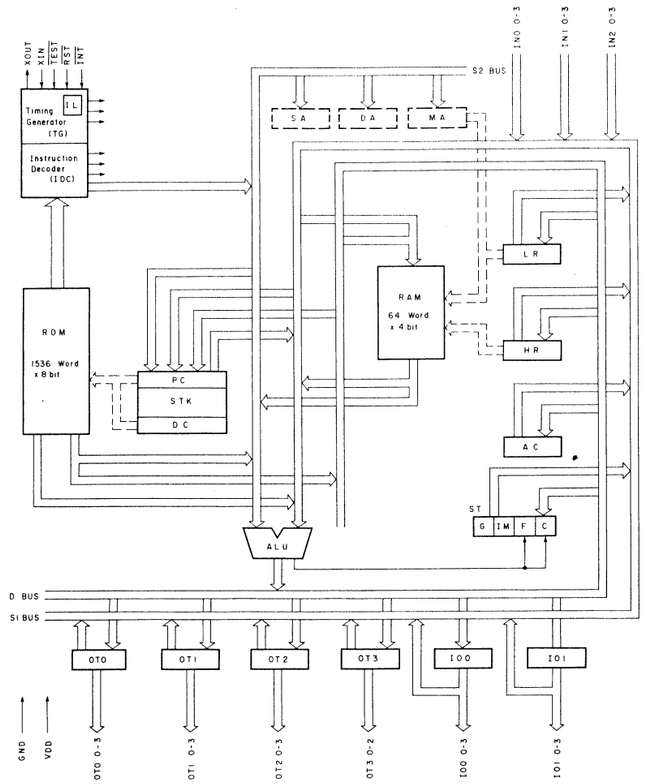
Schematic Ref. No.	Part No.	Description
	— Logic —	
IC601	0B11368A	IC LB1649
IC602	0B06368A	IC LM6416E-106
IC603	0B11020A	IC TMP4315BP-1814
IC604	0B06214A	IC μPD4071BC
IC605	0B06178A	IC μPD4011BC
IC606	0B11369A	IC TA64
Q601	0B06066A	TR 2SD471 (L,M)
Q602,603	0B06013A	TR 2SA733 (P,Q)
Q604,605	0B01872A	TR 2SC945L (P,Q)
Q606,607	0B01872A	TR 2SC945L (P,Q)
Q608	0B06013A	TR 2SA733 (P,Q)
Q609	0B01872A	TR 2SC945L (P,Q)
Q610	0B06299A	TR 2SC2878
Q611,612	0B01872A	TR 2SC945L (P,Q)
Q613	0B01872A	TR 2SC945L (P,Q)
Q614	0B06069A	TR 2SB564 (L,M)
Q615	0B06013A	TR 2SA733 (P,Q)
Q616	0B01872A	TR 2SC945L (P,Q)
Q617,618	0B06013A	TR 2SA733 (P,Q)
Q619	0B01872A	TR 2SC945L (P,Q)
Q620	0B10050A	TR 2SA970 (BL)
Q621	0B01872A	TR 2SC945L (P,Q)
Q622	0B06013A	TR 2SA733 (P,Q)
Q623,624	0B01872A	TR 2SC945L (P,Q)
Q625,626	0B06013A	TR 2SA733 (P,Q)
Q627,628	0B06013A	TR 2SA733 (P,Q)
Q629,630	0B06013A	TR 2SA733 (P,Q)
Q631	0B06013A	TR 2SA733 (P,Q)
ZD601	0B12168A	ZD 10V RD10JS-T1B2
ZD602	0B12150A	ZD 5.6V RD5.6JS-T1B2
ZD603	0B12153A	ZD 6.2V RD6.2JS-T1B2
ZD604	0B12174A	ZD 12V RD12JS-T1B2
D601,602	0B06398A	SiD 1SS176
D603,604	0B06398A	SiD 1SS176
D605,606	0B06398A	SiD 1SS176
D607	0B06398A	SiD 1SS176
D608	0B12586A	SiD 1N4002
D609,610	0B06398A	SiD 1SS176
D611	0B06398A	SiD 1SS176
D612	0B12584A	SiD 1N4148
D613,614	0B06398A	SiD 1SS176
D615	0B06398A	SiD 1SS176
D616,617	0B12584A	SiD 1N4148
D618	0B12584A	SiD 1N4148
D619,620	0B06398A	SiD 1SS176
D621	0B06398A	SiD 1SS176
D622,623	0B06398A	SiD 1SS176
DIN601	0B81754A	8P DIN Socket
L601	0B24148A	Coil Resistor 7
L602	0B51263A	L-C Block
VR601	0B32123A	Semi VR 500
R001	0B09693A	RK 4.7K 1/6W J
R002	0B09701A	RK 10K 1/6W J
R003,004	0B09725A	RK 100K 1/6W J
R005	0B09703A	RK 12K 1/6W J
R006	0B09709A	RK 22K 1/6W J
R007	0B09703A	RK 12K 1/6W J
R008	0B09701A	RK 10K 1/6W J
R009	0B01889A	RK 100K 1/4W J
R010,011	0B09725A	RK 100K 1/6W J
R601	0B09217A	RF 5.6 1/4W J
R602	0B05575A	RK 560 1/4W J
R604,605	0B09670A	RK 510 1/6W J
R606	0B09725A	RK 100K 1/6W J
R607	0B09709A	RK 22K 1/6W J
R608	0B09729A	RK 150K 1/6W J
R609,610	0B09717A	RK 47K 1/6W J
R611	0B09717A	RK 47K 1/6W J
R612	0B09677A	RK 1K 1/6W J
R613	0B01857A	RK 1K 1/4W J
R614,615	0B09677A	RK 1K 1/6W J
R616,617	0B09717A	RK 47K 1/6W J
R618	0B09701A	RK 10K 1/6W J
R619	0B24151A	RF 18 2W J
R620	0B09701A	RK 10K 1/6W J
R621	0B09693A	RK 4.7K 1/6W J
R625	0B09671A	RK 560 1/6W J
R626,627	0B09733A	RK 220K 1/6W J
R628,629	0B09671A	RK 560 1/6W J
R630	0B09671A	RK 560 1/6W J
R635	0B09701A	RK 10K 1/6W J
R636	0B09733A	RK 220K 1/6W J

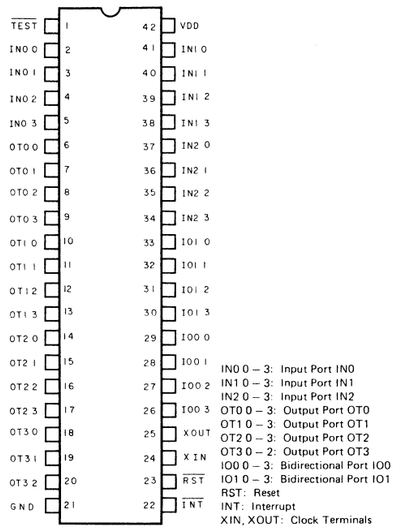
Schematic Ref. No.	Part No.	Description
R637,638	0B09725A	RK 10
R639	0B09725A	RK 10
R640	0B01889A	RK 10
R641	0B09725A	RK 10
R642	0B09677A	RK 1K
R643,644	0B09717A	RK 47
R645,646	0B09717A	RK 47
R647,648	0B09717A	RK 47
R650	0B09713A	RK 33
R651	0B09687A	RK 2.7
R652	0B09725A	RK 10
R653	0B09737A	RK 33
R654	0B05509A	RK 33
R655,656	0B09725A	RK 10
R657	0B09725A	RK 10
R658	0B09701A	RK 10
R659	0B09703A	RK 12
R660,661	0B09693A	RK 4.7
R662	0B09735A	RK 27
R663	0B09733A	RK 22
R664	0B09657A	RK 15
R665	0B09725A	RK 10
R666	0B09693A	RK 4.7
R667	0B09719A	RK 56
R668	0B09713A	RK 33
R669	0B09701A	RK 10
R670	0B01889A	RK 10
R671	0B09713A	RK 33
R672	0B09749A	RK 1M
R673	0B09725A	RK 10
R674	0B09689A	RK 3.3
R675	0B09705A	RK 15
R676	0B09725A	RK 10
R677	0B05575A	RK 56
R678	0B09749A	RK 1M
R679	0B09725A	RK 10
R680	0B09737A	RK 33
R681	0B09725A	RK 10
R682	0B09749A	RK 1M
R683	0B09713A	RK 33
R684	0B09635A	RK 18
R685	0B09701A	RK 10
R686	0B09635A	RK 18
R687	0B09701A	RK 10
R688	0B09635A	RK 18
R689	0B09701A	RK 10
R690	0B09635A	RK 18
R691	0B09701A	RK 10
R692	0B09635A	RK 18
R693	0B09701A	RK 10
R694	0B09635A	RK 18
R695	0B09701A	RK 10
R696	0B09635A	RK 18
R697	0B09701A	RK 10
R698	0B09725A	RK 10
R699	0B09701A	RK 10
C601	0B40079A	CE 22
C602,603	0B09292A	CC 0.
C604	0B01400A	CE 10
C605	0B09282A	CC 10
C606	0B09222A	CE 0.
C607	0B09185A	CE 33
C608	0B01405A	CE 1μ
C609,610	0B09286A	CC 47
C611	0B01405A	CE 1μ
C612	0B09185A	CE 33
C613	0B01405A	CE 1μ
C614	0B09327A	CE 0.
C615	0B01405A	CE 1μ
C616	0B09327A	CE 0.
C617	0B01403A	CE 47
C618	0B05841A	CE 33
C619,620	0B01405A	CE 1μ
C621	0B40360A	CE 10
C622	0B09292A	CC 0.
CN3	0B81766A	9P-T P
CN4	0B81762A	5P-T P
CN5	0B81759A	2P-T P
CN8,9	0B81764A	7P-T P
CN10,11	0B81762A	5P-T P
CN12	0B81764A	7P-T P
	— Miscellaneous —	
	0B60496A	Main P
CN15	0B82591A	3P Rib
CN16	0B83162A	5P Rib
CN17	0B82086B	3P Rib
CN18	0B82591A	3P Rib
CN21	0W19600A	Wire 2

	Description	Schematic Ref. No.	Part No.	Description
			— Dolby NR —	
A	Main P.C.B. Ass'y	IC301	0B11363A	IC CX20188
		ZD301,302	0B12168A	ZD 10V RD10JS-T1B2
Amp. —				
		VR102	0B32126A	Semi VR 5K
		VR202	0B32126A	Semi VR 5K
	TR 2SC2240 (BL)	R110	0B09673A	RK 680 1/6W J
	TR 2SC945L (P,Q)	R111	0B09700A	RK 9.1K 1/6W J
	TR 2SC2240 (BL)	R112	0B09698A	RK 7.5K 1/6W J
	TR 2SC945L (P,Q)	R113	0B22380A	RM 22.1K 1/6W F
	TR 2SC2240 (BL)	R114	0B22201A	RM 562 1/6W F
	TR 2SC945L (P,Q)	R115	0B22294A	RM 3.83K 1/6W F
	TR 2SC2240 (BL)	R116	0B22285A	RM 3.24K 1/6W F
	TR 2SC945L (P,Q)	R117	0B09749A	RK 1M 1/6W J
	ZD 10V RD10JS-T1B2	R118	0B22716A	RM 9.09K 1/4W F
	SiD 1SS176	R119	0B09707A	RK 18K 1/6W J
	SiD 1SS176	R120	0B09681A	RK 1.5K 1/6W J
	Inductor 36mH	R121	0B22229A	RM 1.00K 1/6W F
	Inductor 36mH	R210	0B09673A	RK 680 1/6W J
	Semi VR 2K	R211	0B09700A	RK 9.1K 1/6W J
	Semi VR 2K	R212	0B09698A	RK 7.5K 1/6W J
	RK 5.6K 1/6W J	R213	0B22380A	RM 22.1K 1/6W F
	RK 5.6K 1/6W J	R214	0B22201A	RM 562 1/6W F
	RK 10 1/6W J	R215	0B22294A	RM 3.83K 1/6W F
	RK 470K 1/6W J	R216	0B22285A	RM 3.24K 1/6W F
	RK 100K 1/4W J	R217	0B09749A	RK 1M 1/6W J
	RK 82 1/6W J	R218	0B22716A	RM 9.09K 1/4W F
	RK 27K 1/6W J	R219	0B09707A	RK 18K 1/6W J
	RK 180K 1/6W J	R220	0B09681A	RK 1.5K 1/6W J
	RM 8.25K 1/4W F	R221	0B22229A	RM 1.00K 1/6W F
	RK 2.2K 1/6W J	R301	0B09709A	RK 22K 1/6W J
	RK 100K 1/4W J	R302	0B09466A	RM 130K 1/4W F
	RK 120 1/6W J	R303	0B24146A	RF 62 1/4W J
	RM 14.0K 1/4W F	R304,305	0B09701A	RK 10K 1/6W J
	RM 12.7K 1/4W F	R306	0B24146A	RF 62 1/4W J
	RK 1M 1/6W J	C103	0B05681A	CML 0.01μ 50V J
	RM 44.2K 1/6W F	C104	0B41143A	CPP 5600P 100V G
	RK 12K 1/6W J	C105	0B05813A	CML 0.056μ 50V J
	RM 44.2K 1/6W F	C106	0B05682A	CML 0.068μ 50V J
	RK 5.6K 1/6W J	C107	0B09872A	CMM 0.22μ 50V J
	RK 5.6K 1/6W J	C108	0B05557A	CML 0.015μ 50V J
	RK 10 1/6W J	C109	0B09870A	CMM 0.15μ 50V J
	RK 470K 1/6W J	C110	0B09876A	CMM 0.47μ 50V J
	RK 100K 1/4W J	C111	0B41139A	CPP 3900P 100V G
	RK 82 1/6W J	C112,113	0B41133A	CPP 2200P 100V G
	RK 27K 1/6W J	C141,142	0B01674A	CE 10μ 25V
	RK 180K 1/6W J	C203	0B05681A	CML 0.01μ 50V J
	RM 8.25K 1/4W F	C204	0B41143A	CPP 5600P 100V G
	RK 2.2K 1/6W J	C205	0B05813A	CML 0.056μ 50V J
	RK 100K 1/4W J	C206	0B05682A	CML 0.068μ 50V J
	RK 120 1/6W J	C207	0B09872A	CMM 0.22μ 50V J
	RM 14.0K 1/4W F	C208	0B05557A	CML 0.015μ 50V J
	RM 12.7K 1/4W F	C209	0B09870A	CMM 0.15μ 50V J
	RK 1M 1/6W J	C210	0B09876A	CMM 0.47μ 50V J
	RM 44.2K 1/6W F	C211	0B41139A	CPP 3900P 100V G
	RK 12K 1/6W J	C212,213	0B41133A	CPP 2200P 100V G
	RM 44.2K 1/6W F	C241,242	0B01674A	CE 10μ 25V
	RK 1K 1/6W J	C301	0B01391A	CE 220μ 25V
	RK 100K 1/6W J	C302	0B01402A	CE 4.7μ 25V
	RK 100K 1/4W J	C303	0B01391A	CE 220μ 25V
	CC 100P 50V K	C304	0B01409A	CE 47μ 25V
	CE 22μ 25V			
	CC 220P 50V K		— Input Amp. —	
	CML 0.018μ 50V J			
	CE 3.3μ 50V	IC302	0B06146A	IC NJM4558DD
	CE 47μ 16V	Q105,106	0B01872A	TR 2SC945L(P,Q)
	CPP 390P 100V J	Q205,206	0B01872A	TR 2SC945L(P,Q)
	CML 1000P 50V J	D103	0B06398A	SiD 1SS176
	CML 6800P 50V J	D203	0B06398A	SiD 1SS176
	CE 2.2μ 50V (LN)	L101	0B51262A	L-C Block Blu (MPX)
	CPP 470P 100V J	L201	0B51262A	L-C Block Blu (MPX)
	CC 100P 50V K	R123	0B09709A	RK 22K 1/6W J
	CE 22μ 25V	R124	0B22551A	RM 7.68K 1/4W F
	CC 220P 50V K	R125	0B09689A	RK 3.3K 1/6W J
	CML 0.018μ 50V J	R126,127	0B09749A	RK 1M 1/6W J
	CE 3.3μ 50V	R128	0B09689A	RK 3.3K 1/6W J
	CE 47μ 16V	R129	0B09421A	RM 2.67K 1/4W F
	CPP 390P 100V J	R130	0B09424A	RM 4.75K 1/4W F
	CML 1000P 50V J	R131	0B09203A	RM 10K 1/4W F
	CML 6800P 50V J	R132	0B09653A	RK 100 1/6W J
	CE 2.2μ 50V (LN)	R133	0B09725A	RK 100K 1/6W J
	CPP 470P 100V J	R223	0B09709A	RK 22K 1/6W J
	CC 100P 50V K	R224	0B22551A	RM 7.68K 1/4W F
	CE 100μ 16V	R225	0B09689A	RK 3.3K 1/6W J
	CML 0.1μ 50V J	R226,227	0B09749A	RK 1M 1/6W J
	6P-T Post	R228	0B09689A	RK 3.3K 1/6W J
		R229	0B09421A	RM 2.67K 1/4W F
		R230	0B09424A	RM 4.75K 1/4W F
		R231	0B09203A	RM 10K 1/4W F
		R232	0B09653A	RK 100 1/6W J
		R233	0B09725A	RK 100K 1/6W J
		C114	0B09332A	CE 2.2μ 50V (LN)
		C115	0B05687A	CML 1200P 50V J
		C116	0B09189A	CML 2700P 50V J
		C117	0B09223A	CE 1μ 50V (LN)
		C214	0B09332A	CE 2.2μ 50V (LN)
		C215	0B05687A	CML 1200P 50V J
		C216	0B09189A	CML 2700P 50V J
		C217	0B09223A	CE 1μ 50V (LN)
			— Rec. Level —	
		IC304	0B11027A	IC TC9145P
		Q107	0B01872A	TR 2SC945L (P,Q)
		Q207	0B01872A	TR 2SC945L (P,Q)
		Q301	0B06013A	TR 2SA733 (P,Q)
		D104	0B06398A	SiD 1SS176
		D204	0B06398A	SiD 1SS176
		VR103,104	0B32127A	Semi VR 10K
		VR105	0B32128A	Semi VR 20K
		VR203,204	0B32127A	Semi VR 10K
		VR205	0B32128A	Semi VR 20K
		R137	0B09705A	RK 15K 1/6W J
		R138	0B09577A	RM 7.15K 1/4W F
		R139	0B09689A	RK 3.3K 1/6W J
		R140	0B09749A	RK 1M 1/6W J
		R141	0B09697A	RK 6.8K 1/6W J
		R142	0B09707A	RK 18K 1/6W J
		R143	0B09687A	RK 2.7K 1/6W J
		R144	0B09701A	RK 10K 1/6W J
		R145	0B09687A	RK 2.7K 1/6W J
		R146	0B09693A	RK 4.7K 1/6W J
		R147	0B09705A	RK 15K 1/6W J
		R148	0B01846A	RK 4.7K 1/4W J
		R181	0B09677A	RK 1K 1/6W J
		R237	0B09705A	RK 15K 1/6W J
		R238	0B09577A	RM 7.15K 1/4W F
		R239	0B09689A	RK 3.3K 1/6W J
		R240	0B09749A	RK 1M 1/6W J
		R241	0B09697A	RK 6.8K 1/6W J
		R242	0B09707A	RK 18K 1/6W J
		R243	0B09687A	RK 2.7K 1/6W J
		R244	0B09701A	RK 10K 1/6W J
		R245	0B09687A	RK 2.7K 1/6W J
		R246	0B09693A	RK 4.7K 1/6W J
		R247	0B09705A	RK 15K 1/6W J
		R248	0B01846A	RK 4.7K 1/4W J
		R281	0B09677A	RK 1K 1/6W J
		R312	0B09725A	RK 100K 1/6W J
		R314	0B09725A	RK 100K 1/6W J
		R315	0B05625A	RK 220K 1/4W J
		R316,317	0B09733A	RK 220K 1/6W J
		R319	0B05626A	RK 150K 1/4W J
		R320	0B05622A	RK 2.2K 1/4W J
		R321	0B01681A	RK 3.3K 1/4W J
		R322	0B05622A	RK 2.2K 1/4W J
		C118	0B09783A	CPP 820P 100V J
		C119	0B05814A	CML 8200P 50V J
		C120	0B09189A	CML 2700P 50V J
		C121	0B05550A	CML 1000P 50V J
		C122	0B05814A	CML 8200P 50V J
		C123	0B05659A	CML 5600P 50V J
		C144	0B09323A	CPP 560P 100V J
		C218	0B09783A	CPP 820P 100V J
		C219	0B05814A	CML 8200P 50V J
		C220	0B09189A	CML 2700P 50V J
		C221	0B05550A	CML 1000P 50V J
		C222	0B05814A	CML 8200P 50V J
		C223	0B05659A	CML 5600P 50V J
		C244	0B09323A	CPP 560P 100V J
		C308,309	0B05681A	CML 0.01μ 50V J
		C310	0B05681A	CML 0.01μ 50V J
		C319	0B05550A	CML 1000P 50V J
			— Rec. Amp. —	
		IC305	0B06387A	IC NJM2043DD
		Q108	0B06299A	TR 2SC2878
		Q109	0B01872A	TR 2SC945L (P,Q)
		Q208	0B06299A	TR 2SC2878
		Q209	0B01872A	TR 2SC945L (P,Q)
		D105,106	0B06398A	SiD 1SS176
		D205,206	0B06398A	SiD 1SS176
		D304,305	0B06398A	SiD 1SS176
		L102	0B51259A	Trap Coil 10.5mH
		L103	0B51257A	L-C Block TF10 42-1274
		L202	0B51259A	Trap Coil 10.5mH
		L203	0B51257A	L-C Block TF10 42-1274
		R149	0B09711A	RK 27K 1/6W J
		R150	0B09719A	RK 56K 1/6W J
		R151	0B09703A	RK 12K 1/6W J
		R152	0B09677A	RK 1K 1/6W J
		R153	0B09741A	RK 470K 1/6W J
		R154	0B09671A	RK 560 1/6W J
		R155	0B09705A	RK 15K 1/6W J
		R156	0B09669A	RK 470 1/6W J
		R157	0B09691A	RK 3.9K 1/6W J
		R158	0B09689A	RK 3.3K 1/6W J
		R159	0B09719A	RK 56K 1/6W J
		R160	0B09735A	RK 270K 1/6W J
		R161	0B09697A	RK 6.8K 1/6W J
		R249	0B09711A	RK 27K 1/6W J
		R250	0B09719A	RK 56K 1/6W J
		R251	0B09703A	RK 12K 1/6W J
		R252	0B09677A	RK 1K 1/6W J
		R253	0B09741A	RK 470K 1/6W J
		R254	0B09671A	RK 560 1/6W J
		R255	0B09705A	RK 15K 1/6W J
		R256	0B09669A	RK 470 1/6W J
		R257	0B09691A	RK 3.9K 1/6W J
		R258	0B09689A	RK 3.3K 1/6W J
		R259	0B09719A	RK 56K 1/6W J
		R260	0B09735A	RK 270K 1/6W J
		R261	0B09697A	RK 6.8K 1/6W J
		R331	0B09663A	RK 270 1/6W J
		C125	0B01804A	CML 3900P 50V J
		C126	0B05659A	CML 5600P 50V J
		C127	0B09218A	CE 47μ 16V (LN)
		C128	0B01802A	CML 2200P 50V J
		C129	0B05796A	CML 0.047μ 50V J
		C130	0B09280A	CC 47P 50V J
		C145	0B01405A	CE 1μ 50V
		C146	0B01412A	CE 10μ 16V
		C225	0B01804A	CML 3900P 50V J
		C226	0B05659A	CML 5600P 50V J
		C227	0B09218A	CE 47μ 16V (LN)
		C228	0B01802A	CML 2200P 50V J
		C229	0B05796A	CML 0.047μ 50V J
		C230	0B09280A	CC 47P 50V J
		C245	0B01405A	CE 1μ 50V
		C246	0B01412A	CE 10μ 16V
		C320	0B01403A	CE 47μ 16V
			— Meter Amp. —	
		Q102	0B01872A	TR 2SC945L (P,Q)
		Q103,104	0B10034A	TR 2SC1740S
		Q202	0B01872A	TR 2SC945L (P,Q)
		Q203,204	0B10034A	TR 2SC1740S
		ZD101	0B06230A	ZD 5.1V RD5.1EB2
		ZD201	0B06230A	ZD 5.1V RD5.1EB2
		D102	0B06398A	SiD 1SS176
		D202	0B06398A	SiD 1SS176
		D301	0B06398A	SiD 1SS176
		D405,406	0B06398A	SiD 1SS176
		VR101	0B32130A	Semi VR 100K
		VR201	0B32130A	Semi VR 100K
		R102	0B09725A	RK 100K 1/6W J
		R103	0B09719A	RK 56K 1/6W J
		R104,105	0B09725A	RK 100K 1/6W J
		R106	0B09743A	RK 560K 1/6W J
		R107	0B09729A	RK 150K 1/6W J
		R108	0B09725A	RK 100K 1/6W J
		R109	0B09713A	RK 33K 1/6W J
		R202	0B09725A	RK 100K 1/6W J
		R203	0B09719A	RK 56K 1/6W J
		R204,205	0B09725A	RK 100K 1/6W J
		R206	0B09743A	RK 560K 1/6W J
		R207	0B09729A	RK 150K 1/6W J
		R208	0B09725A	RK 100K 1/6W J
		R209	0B09713A	RK 33K 1/6W J
		R324	0B09216A	RF 10 1/4W J
		R402,403	0B09719A	RK 56K 1/6W J
		C101	0B09148A	CE 10μ 25V (LN)
		C102	0B09394A	CE 0.15μ 50V (LN)
		C201	0B09148A	CE 10μ 25V (LN)
		C202	0B09394A	CE 0.15μ 50V (LN)
		C313	0B01400A	CE 100μ 16V
		Q101	0B06299A	TR 2SC2878
		Q201	0B06299A	TR 2SC2878
		D101	0B06398A	SiD 1SS176
		D201	0B06398A	SiD 1SS176
		R101	0B09697A	RK 6.8K 1/6W J
		R122	0B09685A	RK 2.2K 1/6W J
		R201	0B09697A	RK 6.8K 1/6W J
		R222	0B09685A	RK 2.2K 1/6W J
		R307,308	0B09683A	RK 1.8K 1/6W J
		R309	0B09689A	RK 3.3K 1/6W J
		R310,311	0B09673A	RK 680 1/6W J
		R313	0B09733A	RK 220K 1/6W J
		C305	0B01402A	CE 4.7μ 25V
		C321	0B09292A	CC 0.1μ 50V J
		SW301,302 303	0B70113A	Push Switch SPUJ32
		SW304,305 306	0B70114A	Push Switch SPUJ42
		IC401	0B06380A	IC NJM7812
		IC402	0B11029A	IC NJM7912
		Q401	0B06452A	TR 2SD1406 (Y)
		ZD401	0B12150A	ZD 5.6V RD5.6JS-T1B2
		D401,402	0B12585A	SiD WL01
		D403,404	0B06398A	SiD 1SS176
		R401	0B09914A	RF 330 1/2W J
		C405	0B40197A	CE 4700μ 25V
		C406	0B40362A	CE 6800μ 16V
		C407	0B40363A	CE 2200μ 25V
		C408	0B40361A	CE 2200μ 16V
		C409	0B09377A	CE 4700μ 16V
		C410	0B01403A	CE 47μ 16V
		C411	0B09283A	CC 220P 50V J
		CN13,14	0B81762A	5P-T Post
			0J05415A	Heat Sink (1)
			0E00868A	BT3x8 ⊕ Binding (2)
			0E00985A	BT3x6 ⊕ Binding (Black Chromate)(3)
			— Headphone Amp. —	
		IC303	0B06370A	IC 4556D
		R134	0B09717A	RK 47K 1/6W J
		R135	0B09701A	RK 10K 1/6W J
		R136	0B05579A	RK 22 1/4W J
		R234	0B09717A	RK 47K 1/6W J
		R235	0B09701A	RK 10K 1/6W J
		R236	0B05579A	RK 22 1/4W J
		C143	0B05582A	CML 0.022μ 50V J
		C243	0B05582A	CML 0.022μ 50V J
		C306,307	0B01400A	CE 100μ 16V
			— Bias Osc. —	
		IP301	0B11335A	IC Protector ICP-N15-T104
		Q302	0B06069A	TR 2SB564 (L,M)
		Q303	0B06299A	TR 2SC2878
		D308	0B06398A	SiD 1SS176
		T301	0B51255A	Bias Osc. Unit
		VR107,108	0B32128A	Semi VR 20KB
		VR109	0B32128A	Semi VR 20KB
		VR207,208	0B32128A	Semi VR 20KB
		VR209	0B32128A	Semi VR 20KB
		VR304	0B32126A	Semi VR 5K
		R180	0B09701A	RK 10K 1/6W J
		R183	0B09653A	RK 100 1/6W J
		R184	0B09695A	RK 5.6K 1/6W J
		R185	0B09703A	RK 12K 1/6W J
		R186	0B09705A	RK 15K 1/6W J
		R280	0B09701A	RK 10K 1/6W J
		R283	0B09653A	RK 100 1/6W J
		R284	0B09695A	RK 5.6K 1/6W J
		R285	0B09703A	RK 12K 1/6W J
		R286	0B09705A	RK 15K 1/6W J
		R325	0B09670A	RK 510 1/6W J
		R327	0B09705A	RK 15K 1/6W J
		R329	0B01683A	RK 15K 1/4W J
		R330	0B09701A	RK 10K 1/6W J
		C315	0B01674A	CE 10μ 25V
		C316	0B01405A	CE 1μ 50V
		C317	0B09828A	CPP 8200P 100V J
		C318	0B41229A	CPP 1500P 100V J
		CN2	0B81759A	2P-T Post
			— Switch —	
		Q101	0B06299A	TR 2SC2878
		Q201	0B06299A	TR 2SC2878
		D101	0B06398A	SiD 1SS176
		D201	0B06398A	SiD 1SS176
		R101	0B09697A	RK 6.8K 1/6W J
		R122	0B09685A	RK 2.2K 1/6W J
		R201	0B09697A	RK 6.8K 1/6W J
		R222	0B09685A	RK 2.2K 1/6W J
		R307,308	0B09683A	RK 1.8K 1/6W J
		R309	0B09689A	RK 3.3K 1/6W J
		R310,311	0B09673A	RK 680 1/6W J
		R313	0B09733A	RK 220K 1/6W J
		C305	0B01402A	CE 4.7μ 25V
		C321	0B09292A	CC 0.1μ 50V J
		SW301,302 303	0B70113A	Push Switch SPUJ32
		SW304,305 306	0B70114A	Push Switch SPUJ42
			— DC Supply —	
		IC401	0B06380A	IC NJM7812
		IC402	0B11029A	IC NJM7912
		Q401	0B06452A	TR 2SD1406 (Y)
		ZD401	0B12150A	ZD 5.6V RD5.6JS-T1B2
		D401,402	0B12585A	SiD WL01
		D403,404	0B06398A	SiD 1SS176
		R401	0B09914A	RF 330 1/2W J
		C405	0B40197A	CE 4700μ 25V
		C406	0B40362A	CE 6800μ 16V
		C407	0B40363A	CE 2200μ 25V
		C408	0B40361A	CE 2200μ 16V
		C409	0B09377A	CE 4700μ 16V
		C410	0B01403A	CE 47μ 16V
		C411	0B09283A	CC 220P 50V J
		CN13,14	0B81762A	5P-T Post
			0J05415A	Heat Sink (1)
			0E00868A	BT3x8 ⊕ Binding (2)
			0E00985A	BT3x6 ⊕ Binding (Black Chromate)(3)
		IC601	0B11368A	IC LB1649
		IC602	0B06368A	IC LM6416E-106
		IC603	0B11020A	IC TMP4315BP-1814
		IC604	0B06214A	IC μPD4071BC
		IC605	0B06178A	IC μPD4011BC
		IC606	0B11369A	IC TA64
		Q601	0B06066A	TR 2SD471 (L,M)
		Q602,603	0B06013A	TR 2SA733 (P,Q)
		Q604,605	0B01872A	TR 2SC945L (P,Q)
		Q606,607	0B01872A	TR 2SC945L (P,Q)
		Q608	0B06013A	TR 2SA733 (P,Q)
		Q609	0B01872A	TR 2SC945L (P,Q)
		Q610	0B06299A	TR 2SC2878
		Q611,612	0B01872A	TR 2SC945L (P,Q)
		Q613	0B01872A	TR 2SC945L (P,Q)
		Q614	0B06069A	TR 2SB564 (L,M)
		Q615	0B06013A	TR 2SA733 (P,Q)
		Q616	0B01872A	TR 2SC945L (P,Q)
		Q617,618	0B06013A	TR 2SA733 (P,Q)
		Q619	0B01872A	TR 2SC945L (P,Q)
		Q620	0B10050A	TR 2SA970 (BL)
		Q621	0B01872A	TR 2SC945L (P,Q)
		Q622	0B06013A	TR 2SA733 (P,Q)
		Q623,624	0B01872A	TR 2SC945L (P,Q)
		Q625,626	0B06013A	TR 2SA733 (P,Q)
		Q627,628	0B06013A	TR 2SA733 (P,Q)
		Q629,630	0B06013A	TR 2SA733 (P,Q)
		Q631	0B06013A	TR 2SA733 (P,Q)
		ZD601	0B12168A	ZD 10V RD10JS-T1B2
		ZD602	0B12150A	ZD 5.6V RD5.6JS-T1B2
		ZD603	0B12153A	ZD 6.2V RD6.2JS-T1B2
		ZD604	0B12174A	ZD 12V RD12JS-T1B2
		D601,602	0B06398A	SiD 1SS176
		D603,604	0B06398A	SiD 1SS176
		D605,606	0B06398A	SiD 1SS176
		D607	0B06398A	SiD 1SS176
		D608	0B12586A	SiD 1N4002
		D609,610	0B06398A	SiD 1SS176
		D611	0B06398A	SiD 1SS176
		D612	0B12584A	SiD 1N4148
		D613,614	0B06398A	SiD 1SS176
		D615	0B06398A	SiD 1SS176
		D616,617	0B12584A	SiD 1N4148
		D618	0B12584A	SiD 1N4148
		D619,620	0B06398A	SiD 1SS176
		D621	0B06398A	SiD 1SS176
		D622,623	0B06398A	SiD 1SS176
		DIN601	0B81754A	8P DIN Socket
		L601	0B24148A	Coil Resistor 7
		L602	0B51263A	L-C Block
		VR601	0B32123A	Semi VR 500
		R001	0B09693A	RK 4.7K 1/6W J
		R002	0B09701A	RK 10K 1/6W J
		R003,004	0B09725A	RK 100K 1/6W J
		R005	0B09703A	RK 12K 1/6W J
		R006	0B09709A	RK 22K 1/6W J
		R007	0B09703A	RK 12K 1/6W J
		R008	0B09701A	RK 10K 1/6W J
		R009	0B01889A	RK 100K 1/4W J
		R010,011	0B09725A	RK 100K 1/6W J
		R601	0B09217A	RF 5.6 1/4W J
		R602	0B05575A	RK 560 1/4W J
		R604,605	0B09670A	RK 510 1/6W J
		R606	0B09725A	RK 100K 1/6W J
		R607	0B09709A	RK 22K 1/6W J
		R608	0B09729A	RK 150K 1/6W J
		R609,610	0B09717A	RK 47K 1/6W J
		R611	0B09717A	RK 47K 1/6W J
		R612	0B09677A	RK 1K 1/6W J
		R613	0B01857A	RK 1K 1/4W J
		R614,615	0B09677A	RK 1K 1/6W J
		R616,617	0B09717A	RK 47K 1/6W J
		R618	0B09701A	RK 10K 1/6W J
		R619	0B24151A	RF 18 2W J
		R620	0B09701A	RK 10K 1/6W J
		R621	0B09693A	RK 4.7K 1/6W J
		R625	0B09671A	RK 560 1/6W J
		R626,627	0B09733A	RK 220K 1/6W J
		R628,629	0B09671A	RK 560 1/6W J
		R630	0B09671A	RK 560 1/6W J
		R635	0B09701A	RK 10K 1/6W J
		R636	0B09733A	RK 220K 1/6W J
		R637,638	0B09725A	RK 100K 1/6W J
		R639	0B09725A	RK 100K 1/6W J
		R640	0B01889A	RK 100K 1/4W J
		R641	0B09725A	RK 100K 1/6W J
		R642	0B09677A	RK 1K 1/6W J
		R643,644	0B09717A	RK 47K 1/6W J
		R645,646	0B09717A	RK 47K 1/6W J
		R647,648	0B09717A	RK 47K 1/6W J
		R650	0B09713A	RK 33K 1/6W J
		R651	0B09687A	RK 2.7K 1/6W J
		R652	0B09725A	RK 100K 1/6W J
		R653	0B09737A	RK 330K 1/6W J
		R654	0B05509A	RK 33K 1/4W J
		R655,656	0B09725A	RK 100K 1/6W J
		R657	0B09725A	RK 100K 1/6W J
		R658	0B09701A	RK 10K 1/6W J
		R659	0B09703A	RK 12K 1/6W J
		R660,661	0B09693A	RK 4.7K 1/6W J
		R662	0B09735A	RK 270K 1/6W J
		R663	0B09733A	RK 220K 1/6W J
		R664	0B09657A	RK 150 1/6W J
		R665	0B09725A	RK 100K 1/6W J
		R666	0B09693A	RK 4.7K 1/6W J
		R667	0B09719A	RK 56K 1/6W J
		R668	0B09713A	RK 33K 1/6W J
		R669	0B09701A	RK 10K 1/6W J
		R670	0B01889A	RK 100K 1/4W J
		R671	0B09713A	RK 33K 1/6W J
		R672	0B09749A	RK 1M 1/6W J
		R673	0B09725A	RK 100K 1/6W J
		R674	0B09689A	RK 3.3K 1/6W J
		R675	0B09705A	RK 15K 1/6W J
		R676	0B09725A	RK 100K 1/6W J
		R677	0B05575A	RK 560 1/4W J
		R678	0B09749A	RK 1M 1/6W J
		R679	0B09725A	RK 100K 1/6W J
		R680	0B09737A	RK 330K 1/6W J
		R681	0B09725A	RK 100K 1/6W J
		R682	0B09749A	RK 1M 1/6W J
		R683	0B09713A	RK 33K 1/6W J
		R684	0B09635A	RK 18 1/6W J
		R685	0B09701A	RK 10K 1/6W J
		R686	0B09635A	RK 18 1/6W J
		R687	0B09701A	RK 10K 1/6W J
		R688	0B09635A	RK 18 1/6W J
		R689	0B09701A	RK 10K 1/6W J
		R690	0B09635A	RK 18 1/6W J
		R691	0B09701A	RK 10K 1/6W J
		R692	0B09635A	RK 18 1/6W J
		R693	0B09701A	RK 10K 1/6W J
		R694	0B09635A	RK 18 1/6W J
		R695	0B09701A	RK 10K 1/6W J
		R696	0B09635A	RK 18 1/6W J
		R697	0B09701A	RK 10K 1/6W J
		R698	0B09725A	RK 100K 1/6W J
		R699	0B09701A	RK 10K 1/6W J
		C601	0B40079A	CE 220μ 16V
		C602,603	0B09292A	CC 0.1μ 50V Z
		C604	0B01400A	CE 100μ 16V
		C605	0B09282A	CC 100P 50V K
		C606	0B09222A	CE 0.47μ 50V (LN)
		C607	0B09185A	CE 33μ 10V (LN)
		C608	0B01405A	CE 1μ 50V
		C609,610	0B09286A	CC 470P 50V K
		C611	0B01405A	CE 1μ 50V
		C612	0B09185A	CE 33μ 10V (LN)
		C613	0B01405A	CE 1μ 50V
		C614	0B09327A	CE 0.33μ 50V (LN)
		C615	0B01405A	CE 1μ 50V
		C616	0B09327A	CE 0.33μ 50V (LN)
		C617	0B01403A	CE 47μ 16V
		C618	0B05841A	CE 330μ 10V
		C619,620	0B01405A	CE 1μ 50V
		C621	0B40360A	CE 1000μ 16V
		C622	0B09292A	CC 0.1μ 50V Z
		CN3	0B81766A	9P-T Post
		CN4	0B81762A	5P-T Post
		CN5	0B81759A	2P-T Post
		CN8,9	0B81764A	7P-T Post
		CN10,11	0B81762A	5P-T Post
		CN12	0B81764A	7P-T Post
			— Miscellaneous —	
			0B60496A	Main P.C.B.
		CN15	0B82591A	3P Ribbon Cable 100
		CN16	0B83162A	5P Ribbon Cable 80
		CN17	0B82086B	3P Ribbon Cable 80
		CN18	0B82591A	3P Ribbon Cable 100
		CN21	0W19600A	Wire 2791 24 600

9. SCHEMATIC DIAGRAM

9.1. IC Block Diagrams

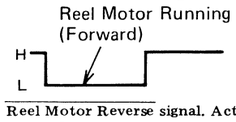
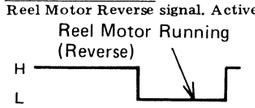
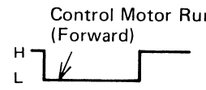
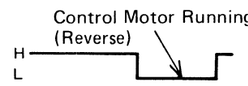
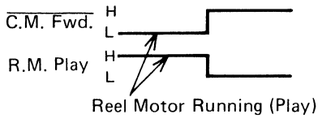
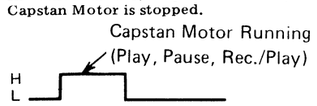
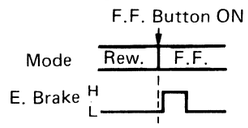
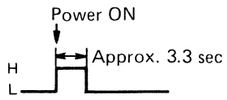
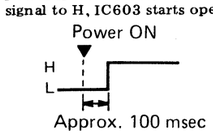




IN0 0 – 3: Input Port IN0
IN1 0 – 3: Input Port IN1
IN2 0 – 3: Input Port IN2
OT0 0 – 3: Output Port OT0
OT1 0 – 3: Output Port OT1
OT2 0 – 3: Output Port OT2
OT3 0 – 2: Output Port OT3
IO0 0 – 3: Bidirectional Port IO0
IO1 0 – 3: Bidirectional Port IO1
RST: Reset
INT: Interrupt
XIN, XOUT: Clock Terminals

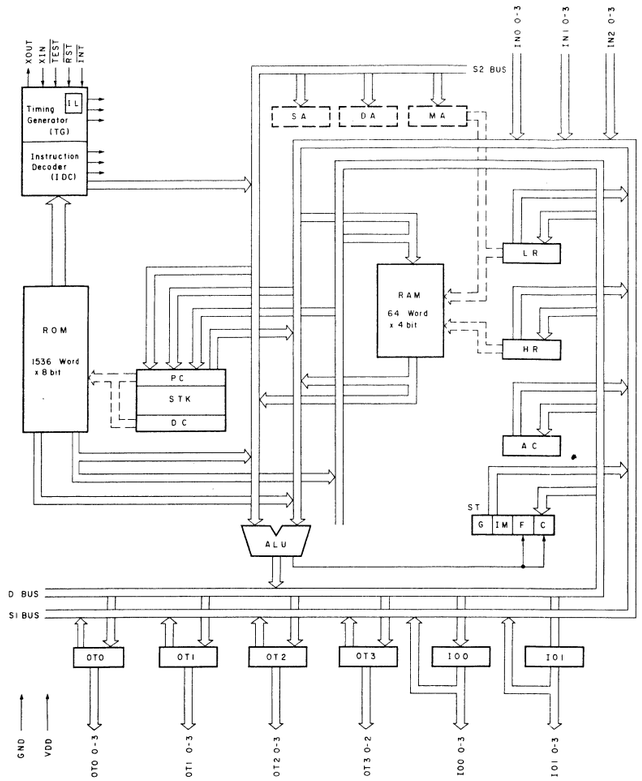
Fig. 9.1.1 4-Bit Micro-processor TMP4315BP-1814

IC603 (TMP4315BP-1814)

Pin No.	Signal Name	In/ Out	Function
1	Test	—	Not used.
2	Cam (0)	In	Mechanism position detecting signals.
3	Cam (1)	In	Mechanism mode can be sensed according to states of Cam (0), Cam (1) and Cam (2).
4	Cam (2)	In	
5	$\overline{\text{Eject}}$	In	$\overline{\text{Eject}}$ signal. Active L. Used to detect whether the Cassette Case is open. When it is open, this signal is L. In this condition, the CR-2 is in Stop mode and no pushbutton operation is enabled.
6	$\overline{\text{R.M. Fwd.}}$	Out	$\overline{\text{Reel Motor Forward}}$ signal. Active L. 
7	$\overline{\text{R.M. Rev.}}$	Out	$\overline{\text{Reel Motor Reverse}}$ signal. Active L. 
8	$\overline{\text{C.M. Fwd.}}$	Out	$\overline{\text{Control Motor Forward}}$ signal. Active L. 
9	$\overline{\text{C.M. Rev.}}$	Out	$\overline{\text{Control Motor Reverse}}$ signal. Active L. 
10	R.M. Play	Out	Reel Motor Play signal. Active H. In Play mode, C.M. Fwd. becomes L, and R.M. Play becomes H. 
11	Capstan M	Out	Capstan Motor Run signal. Active H. In Play, Pause, or Rec./Play mode, Capstan M is H and Capstan Motor runs. In other modes, Capstan M is L, so Capstan Motor is stopped. 
12	E. Brake	Out	Electric Brake signal. Active H. Generates H pulse upon change in mode. 
13	Source Mute	Out	Source Mute signal. Active H. Issues H pulse for 3.3 sec after power is turned ON. Used for timer recording circuit. 
14	Line Mute	Out	Line Output Mute signal. Active H. Stays at L only in Play or Rec./Play mode. Deactivates mute of line outputs.
15	Rec. Mute	Out	Record Mute signal. Active H. Stays at L only in Rec./Play mode. Releases record mute.
16	$\overline{\text{Rew. Mode}}$	Out	$\overline{\text{Rewind Mode}}$ signal. Active L.
17	$\overline{\text{F.F. Mode}}$	Out	$\overline{\text{F.F. Mode}}$ signal. Active L.
18	$\overline{\text{Pause Mode}}$	Out	$\overline{\text{Pause Mode}}$ signal. Active L. Used for lighting of Pause lamp.
19	$\overline{\text{Play Mode}}$	Out	$\overline{\text{Play Mode}}$ signal. Active L. Used for lighting of Play lamp.
20	$\overline{\text{Rec. Mode}}$	Out	$\overline{\text{Record Mode}}$ signal. Active L. Used for lighting of Record lamp.
21	Vss	In	GND.
22	$\overline{\text{INT}}$	In	$\overline{\text{Interrupt}}$ signal. Active L. Allows input of shut-off pulse train. Detects tape running, i.e., rotation of Take-up Reel Hub.
23	$\overline{\text{Reset}}$	In	$\overline{\text{Reset}}$ signal. Active L. Held at L for approx. 100 msec after power is turned ON. Upon change of this signal to H, IC603 starts operation. 
24	EXtal	In	External circuit for clock oscillation.
25	Xtal	In	Oscillating frequency = 550 kHz.
26	$\overline{\text{Rec.}}$	—	Not used.
27	AMS	—	Not used.
28	$\overline{\text{Zero}}$	In	Not used.
29	Memory	In	Memory Switch ON signal. Active H. Held at H when Memory switch is set to ON. (With this switch set to ON, tape will stop automatically when the tape counter indication "000" is reached during rewind or fast-forward.)
30	$\overline{\text{A. Rew.}}$	In	$\overline{\text{Auto Rewind}}$ and $\overline{\text{Auto Play}}$ sig
31	$\overline{\text{A. Play}}$	In	Active L. These signals are L when Timer set to OFF and, at the same ti Repeat swtich is set to ON. (With these signals set to L, au function is performed and the p rewind cycle is continuously between the tape end and the t Furthermore, if Memory switch ON, the playback/rewind continuously repeated between end and the tape counter i "000".)
32	$\overline{\text{T. Rec.}}$	In	$\overline{\text{Timer Recording}}$ signal. Active l When power is turned ON wi switch in Record position, be for approx. 3.3 sec, causing un recording to start.
33	$\overline{\text{T. Play}}$	In	$\overline{\text{Timer Play}}$ signal. Active L. Held at L upon setting of Tim to the Play position.
34	$\overline{\text{K. Pause}}$	In	Pause button input terminal. Be upon push of Pause button.
35	$\overline{\text{K. Rec.}}$	In	Record button input terminal. L upon push of Record button.
36	$\overline{\text{R. Mute}}$	—	Not used.
37	SEA	—	Not used.
38	$\overline{\text{K. Play}}$	In	Play button input terminal. Be upon push of Play button.
39	$\overline{\text{K. F.F.}}$	In	F.F. button input terminal. Be upon push of F.F. button.
40	$\overline{\text{K. Rew.}}$	In	Rewind button input terminal. L upon push of Rewind button.
41	$\overline{\text{K. Stop}}$	In	Stop signal input terminal. At all operations.
42	VDD	In	+5 V.

9. SCHEMATIC DIAGRAM

9.1. IC Block Diagrams



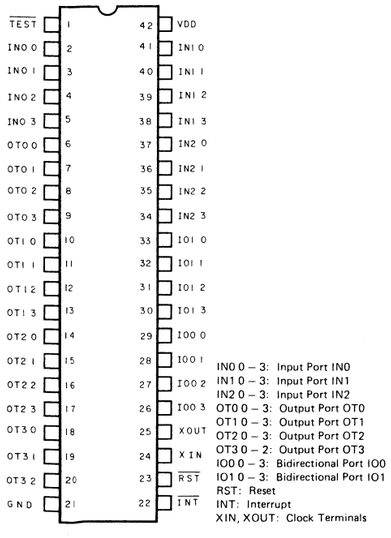
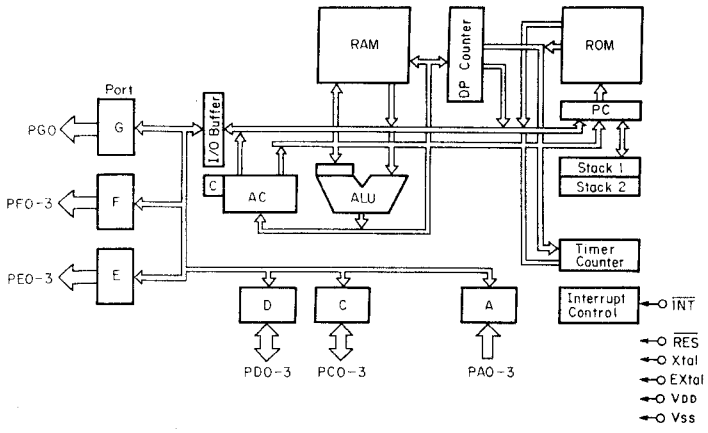


Fig. 9.1.1 4-Bit Micro-processor TMP4315BP-1814

IC603 (TMP4315BP-1814)

Pin No.	Signal Name	In/ Out	Function
1	Test	—	Not used.
2	Cam (0)	In	Mechanism position detecting signals.
3	Cam (1)	In	Mechanism mode can be sensed according to states of Cam (0), Cam (1) and Cam (2).
4	Cam (2)	In	
5	$\overline{\text{Eject}}$	In	$\overline{\text{Eject}}$ signal. Active L. Used to detect whether the Cassette Case is open. When it is open, this signal is L. In this condition, the CR-2 is in Stop mode and no pushbutton operation is enabled.
6	R.M. Fwd.	Out	Reel Motor Forward signal. Active L. Reel Motor Running (Forward) H L
7	R.M. Rev.	Out	Reel Motor Reverse signal. Active L. Reel Motor Running (Reverse) H L
8	C.M. Fwd.	Out	Control Motor Forward signal. Active L. Control Motor Running (Forward) H L
9	C.M. Rev.	Out	Control Motor Reverse signal. Active L. Control Motor Running (Reverse) H L
10	R.M. Play	Out	Reel Motor Play signal. Active H. In Play mode, C.M. Fwd. becomes L, and R.M. Play becomes H. C.M. Fwd. H L R.M. Play H L Reel Motor Running (Play)
11	Capstan M	Out	Capstan Motor Run signal. Active H. In Play, Pause, or Rec./Play mode, Capstan M is H and Capstan Motor runs. In other modes, Capstan M is L, so Capstan Motor is stopped. Capstan Motor Running (Play, Pause, Rec./Play) H L
12	E. Brake	Out	Electric Brake signal. Active H. Generates H pulse upon change in mode. F.F. Button ON Mode Rew. F.F. E. Brake H L
13	Source Mute	Out	Source Mute signal. Active H. Issues H pulse for 3.3 sec after power is turned ON. Used for timer recording circuit. Power ON H L Approx. 3.3 sec
14	Line Mute	Out	Line Output Mute signal. Active H. Stays at L only in Play or Rec./Play mode. Deactivates mute of line outputs.
15	Rec. Mute	Out	Record Mute signal. Active H. Stays at L only in Rec./Play mode. Releases record mute.
16	$\overline{\text{Rew. Mode}}$	Out	$\overline{\text{Rewind Mode}}$ signal. Active L.
17	$\overline{\text{F.F. Mode}}$	Out	$\overline{\text{F.F. Mode}}$ signal. Active L.
18	$\overline{\text{Pause Mode}}$	Out	$\overline{\text{Pause Mode}}$ signal. Active L. Used for lighting of Pause lamp.
19	$\overline{\text{Play Mode}}$	Out	$\overline{\text{Play Mode}}$ signal. Active L. Used for lighting of Play lamp.
20	$\overline{\text{Rec. Mode}}$	Out	$\overline{\text{Record Mode}}$ signal. Active L. Used for lighting of Record lamp.
21	Vss	In	GND.
22	$\overline{\text{INT}}$	In	$\overline{\text{Interrupt}}$ signal. Active L. Allows input of shut-off pulse train. Detects tape running, i.e., rotation of Take-up Reel Hub.
23	$\overline{\text{Reset}}$	In	$\overline{\text{Reset}}$ signal. Active L. Held at L for approx. 100 msec after power is turned ON. Upon change of this signal to H, IC603 starts operation. Power ON H L Approx. 100 msec
24	EXtal	In	External circuit for clock oscillation.
25	Xtal	In	Oscillating frequency = 550 kHz.
26	$\overline{\text{Rec.}}$	—	Not used.
27	AMS	—	Not used.
28	$\overline{\text{Zero}}$	In	Not used.
29	Memory	In	Memory Switch ON signal. Active H. Held at H when Memory switch is set to ON. (With this switch set to ON, tape will stop automatically when the tape counter indication "000" is reached during rewind or fast-forward.)
30	$\overline{\text{A. Rew.}}$	In	$\overline{\text{Auto Rewind}}$ and $\overline{\text{Auto Play}}$ signals.
31	$\overline{\text{A. Play}}$	In	Active L. These signals are L when Timer switch is set to OFF and, at the same time, Auto Repeat swtich is set to ON. (With these signals set to L, auto repeat function is performed and the playback/rewind cycle is continuously repeated between the tape end and the tape start. Furthermore, if Memory switch is set to ON, the playback/rewind cycle is continuously repeated between the tape end and the tape counter indication "000".)
32	$\overline{\text{T. Rec.}}$	In	$\overline{\text{Timer Recording}}$ signal. Active L. When power is turned ON with Timer switch in Record position, becomes L for approx. 3.3 sec, causing unattended recording to start.
33	$\overline{\text{T. Play}}$	In	$\overline{\text{Timer Play}}$ signal. Active L. Held at L upon setting of Timer switch to the Play position.
34	$\overline{\text{K. Pause}}$	In	Pause button input terminal. Becomes L upon push of Pause button.
35	$\overline{\text{K. Rec.}}$	In	Record button input terminal. Becomes L upon push of Record button.
36	$\overline{\text{R. Mute}}$	—	Not used.
37	SEA	—	Not used.
38	$\overline{\text{K. Play}}$	In	Play button input terminal. Becomes L upon push of Play button.
39	$\overline{\text{K. F.F.}}$	In	F.F. button input terminal. Becomes L upon push of F.F. button.
40	$\overline{\text{K. Rew.}}$	In	Rewind button input terminal. Becomes L upon push of Rewind button.
41	$\overline{\text{K. Stop}}$	In	Stop signal input terminal. At L, stops all operations.
42	VDD	In	+5 V.



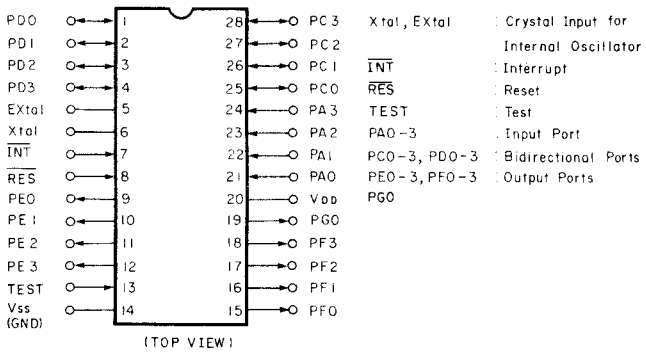
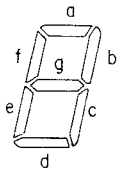


Fig. 9.1.2 4-Bit Micro-processor LM6416E-106

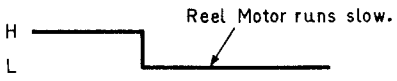
IC602 (LM6416E-106)

Pin No.	Signal Name	In/ Out	Function
1	CLR	In	Reset button input terminal. Upon push of Reset button, Reset signal becomes L and counter is cleared to "0000".
2	K. Play	In	Play button input terminal. Becomes L upon push of Play button.
3	K. F.F.	In	F.F. button input terminal. Becomes L upon push of F.F. button.
4	K. Rew.	In	Rewind button input terminal. Becomes L upon push of Rewind button.
5	EXtal	In	Terminals for clock oscillation. RC circuit is
6	Xtal	In	connected.
7	INT	In	Interrupt signal. Active L. Shut-off pulse train is input. Input pulse train is counted for tape counter display.
8	Reset	In	Reset signal. Active L. Held at L for approx. 100 msec after power is turned ON.
9	f		Display segment drive signals.
10	b	Out	Segment lights at L.
11	a		
12	d		

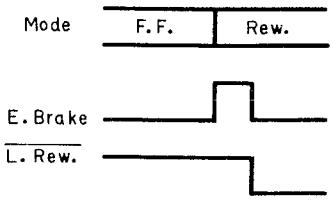


13	Test	In	Not used.
14	Vss	In	GND.
15	g		Display segment drive signals.
16	a	Out	Segment lights at L.
17	c		
18	D4	Out	The 4th (rightmost) digit select signal. Active L.

Pin No.	Signal Name	In/ Out	Function
19	Motor Slow	Out	Motor Slow signal. Active L. When Motor Slow signal is L, reel motor speed is reduced.



20	V_{DD}	In	+5 V
21	L. Rew.	In	LED Rewind signal. Active L. When mode is changed to Rewind, L. Rew. signal becomes L after H period of E. Brake signal ended.



22	L. F.F.	In	LED F.F. signal. Active L. Timing is similar to L. Rew. signal.
23	L. Stop	In	LED Stop signal. Active L. Timing is similar to L. Rew. signal.
24	Memory Stop	In	Memory Stop switch input terminal of Memory Stop/Auto Repeat switch. Memory Stop signal is L when Memory Stop is selected.
25	Memory Play	In	Not used.
26	D3		The 3rd, 2nd, and 1st (leftmost) digit select
27	D2	Out	signals. Active L.
28	D1		

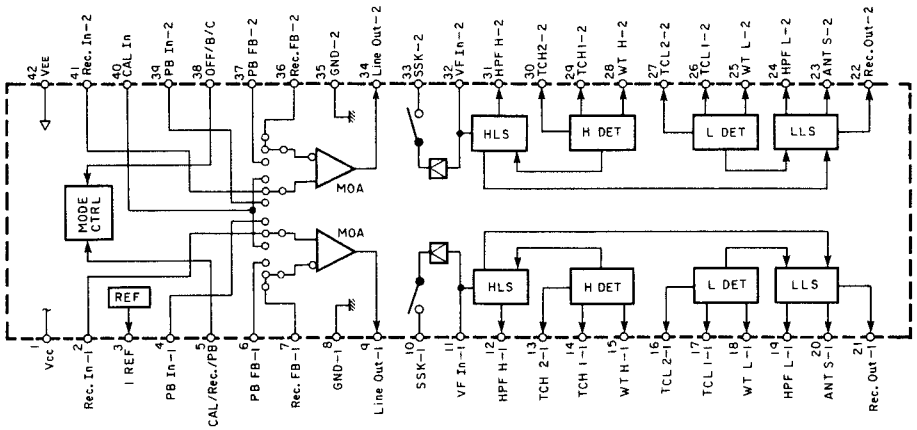


Fig. 9.1.3 Dolby NR IC CX20188

IC301 (CX20188)

Pin No.	Signal Name	Function
1	Vcc	Positive power supply input terminal.
2,41	Rec. In	Record signal input terminal.
3	I Ref.	Reference current input terminal.
4,39	PB In	PB signal input terminal.
5	CAL/Rec./ PB	Calibration/Recording/Playback select terminal.
6,37	PB FB	Playback signal feedback terminal.
7,36	Rec. FB	Record signal feedback terminal.
8,35	GND	GND terminal.
9,34	Line Out	Line signal (decoded signal) output terminal.
10,33	SSK	Spectral skewing switch terminal.
11,32	VF In	Encode circuit input terminal.
12,31	HPF H	HLS high-pass filter terminal.
13,30	TCH 2	HLS detector time constant determination terminal 2.
14,29	TCH 1	HLS detector time constant determination terminal 1.
15,28	WT H	HLS weighting terminal.
16,27	TCL 2	LLS detector time constant determination terminal 2.
17,26	TCL 1	LLS detector time constant determination terminal 1.
18,25	WT L	LLS weighting terminal.
19,24	HPF L	LLS high-pass filter terminal.
20,23	ANT S	Anti-saturation terminal.
21,22	Rec. Out	Record signal (encoded signal) output terminal.
38	OFF/B/C	Dolby NR OFF/B-type/C-type select terminal.
40	CAL In	Calibration input terminal. Not used.
42	V_{EE}	Negative power supply input terminal.

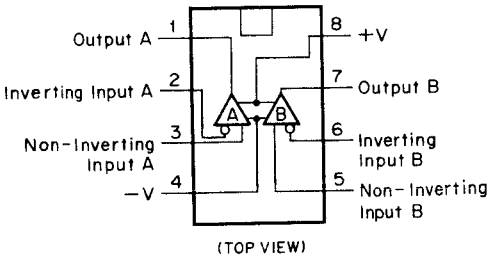


Fig. 9.1.4 Operational Amp. IC 4556D, 4558DD, 2043DD

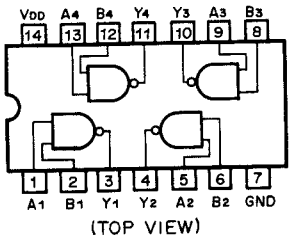


Fig. 9.1.6 NAND Gate C-MOS IC μPD4011BC

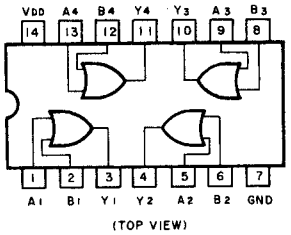


Fig. 9.1.5 OR Gate C-MOS IC μPD4071BC

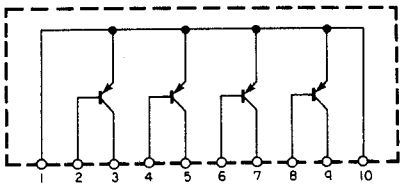
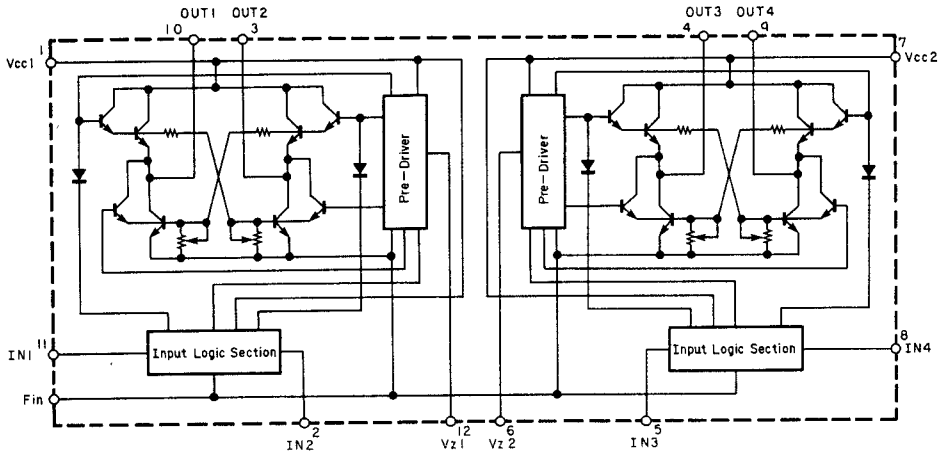


Fig. 9.1.7 Transistor Array TA64



INPUT IN1/3	INPUT IN2/4	OUTPUT OUT1/3	OUTPUT OUT2/4	OPERATION
0	0	0	0	Braking
1	0	1	0	Forward (Reverse)
0	1	0	1	Reverse (Forward)
1	1	0	0	Braking

Fig. 9.1.8 Motor Driver IC LB1649

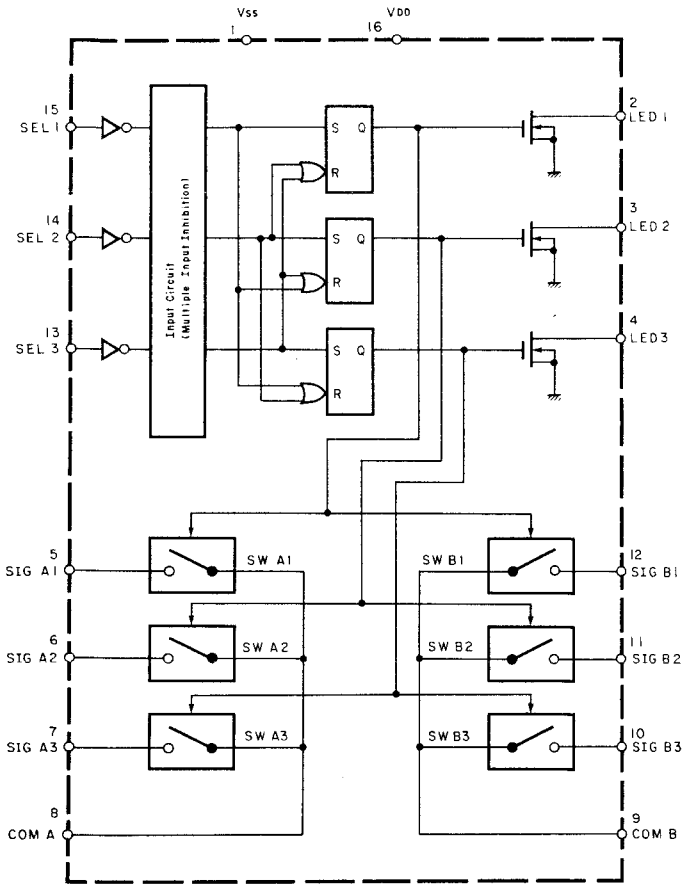


Fig. 9.1.9 Analog Switch Selector TC9145P

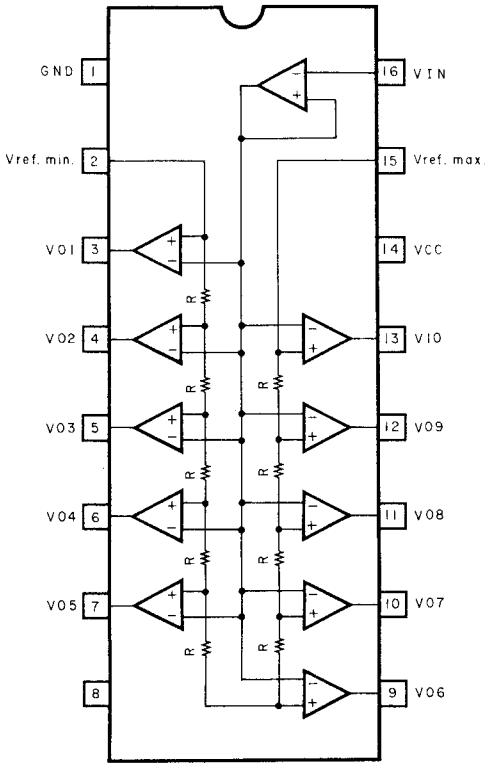
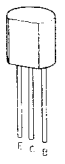
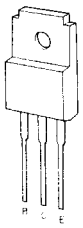


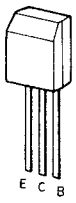
Fig. 9.1.10 Level Meter Driver TA7612AP



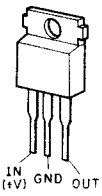
2SA733
2SA970
2SC945
2SC1740
2SC2240
2SC2878



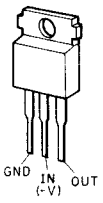
2SD1406



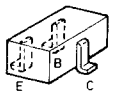
2SB564
2SD471



NJM7812



NJM7912



2SC2812

9.2. Schematic Diagram

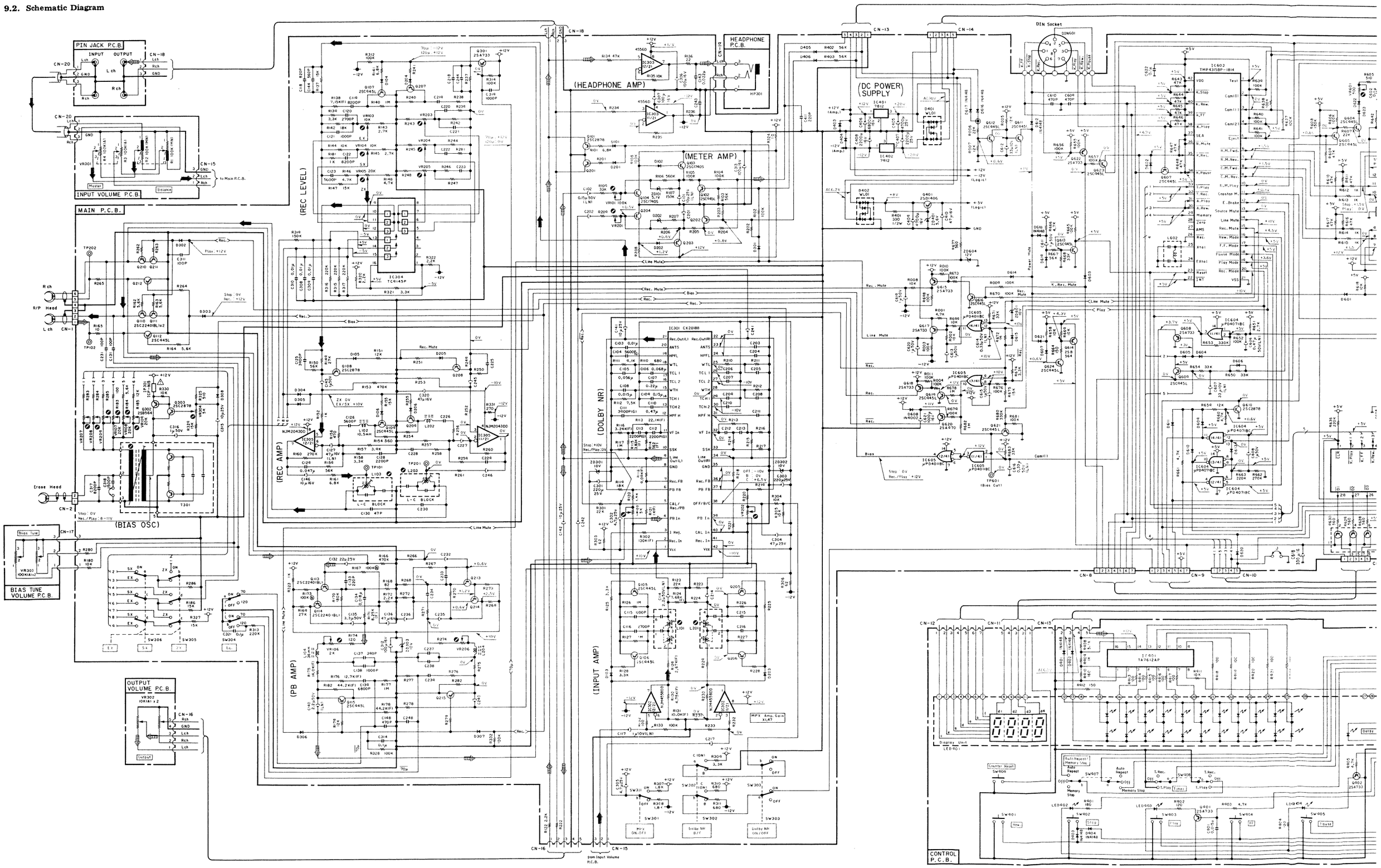


Fig. 9.2

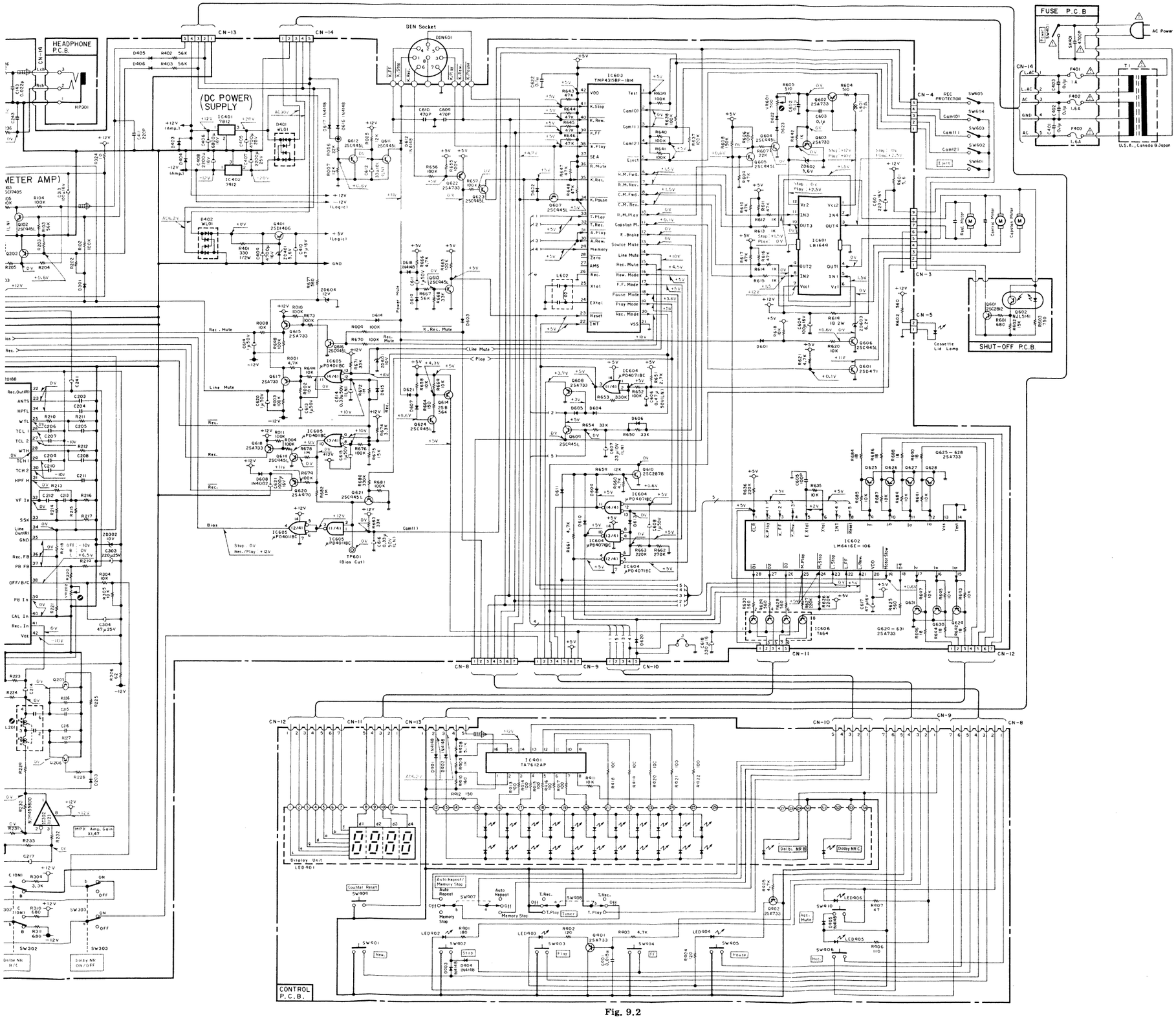


Fig. 9.2

WARNING:

Parts marked with the symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.
It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

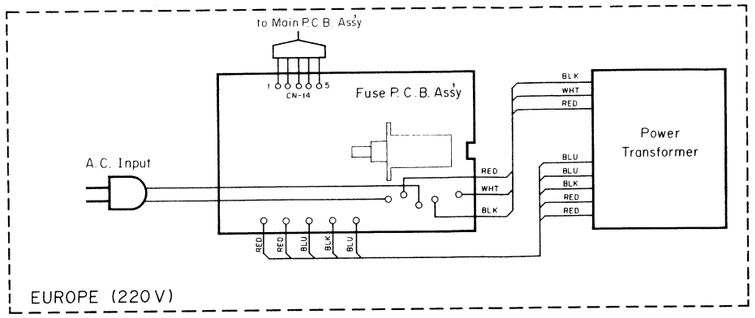
CAUTION:

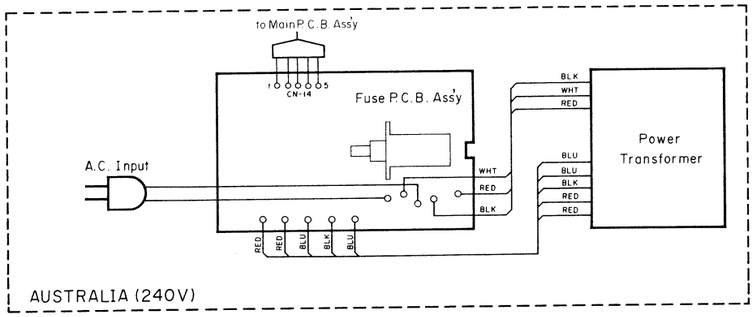
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.
WARNING — DO NOT return the unit to the customer until the problem is located and corrected.

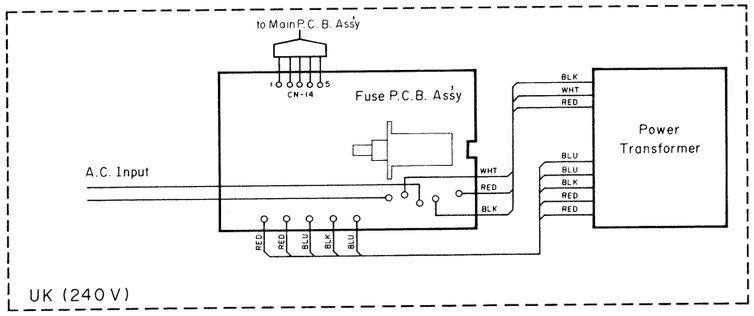
Notes:

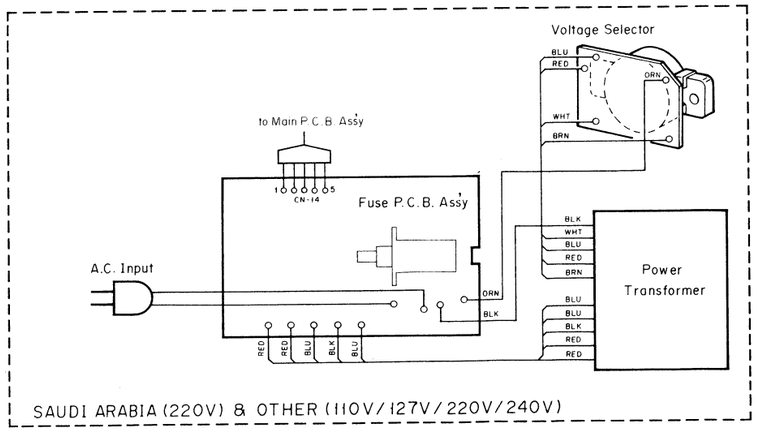
1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
2. 2SA733, 2SA608SP, 2SA1048 and 2SA1175 are interchangeable with each other.
3. 2SC945, 2SC536SP, 2SC2458 and 2SC2785 are interchangeable with each other.
4. Voltage measuring condition:
   - Stop mode (with no input signal) unless otherwise specified.
   - Bias: ZX position, Eq: 70 µs
   - Timer Switch: OFF
   - Memory Stop/Auto Repeat Switch: OFF
   - Play mode: Cassette with no tape played back.

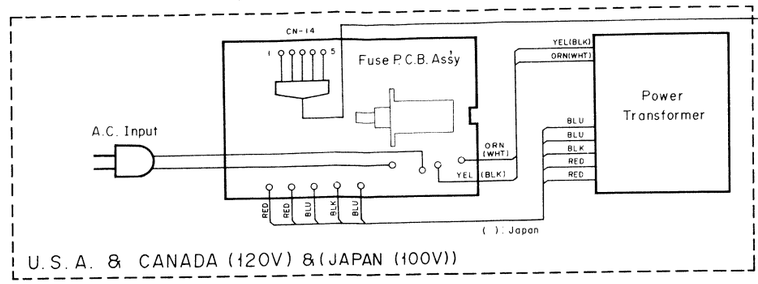
10. WIRING DIAGRAM











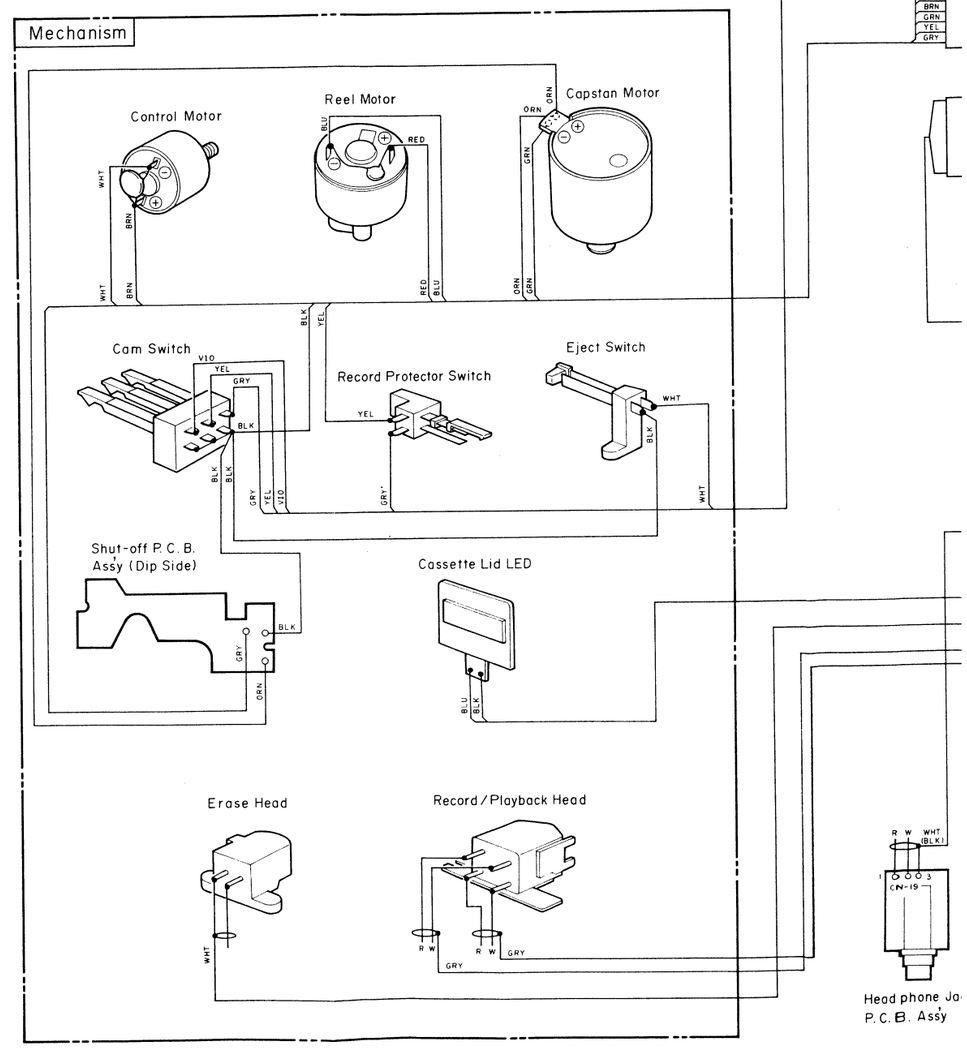
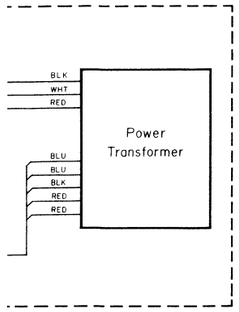


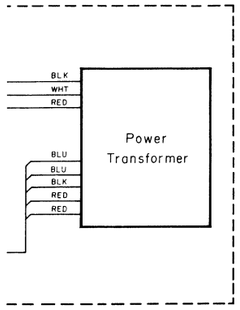
Fig. 10

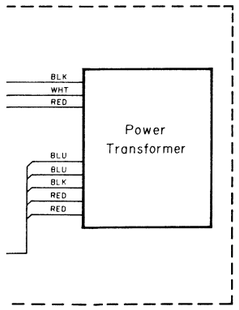
Notes: 1. Table of wire colors

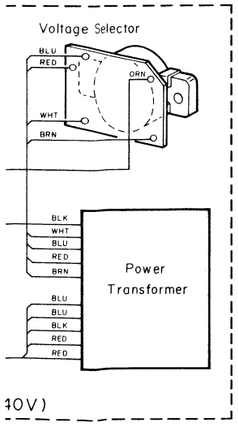
BRN — Brown	BLU — Blue
RED — Red	VIO — Violet
ORN — Orange	GRY — Gray
YEL — Yellow	WHT — White
GRN — Green	BLK — Black

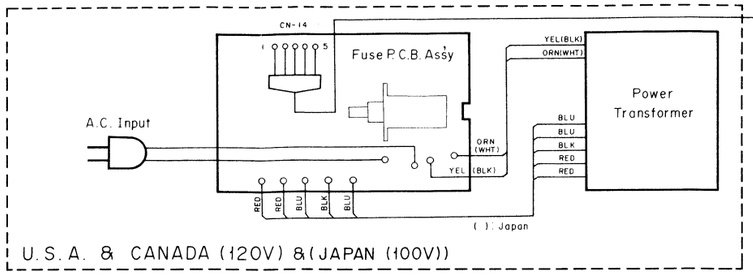
2. Component side view of the P.C.B. is illustrated unless otherwise specified.
3. Wire tube color is shown in ( ).

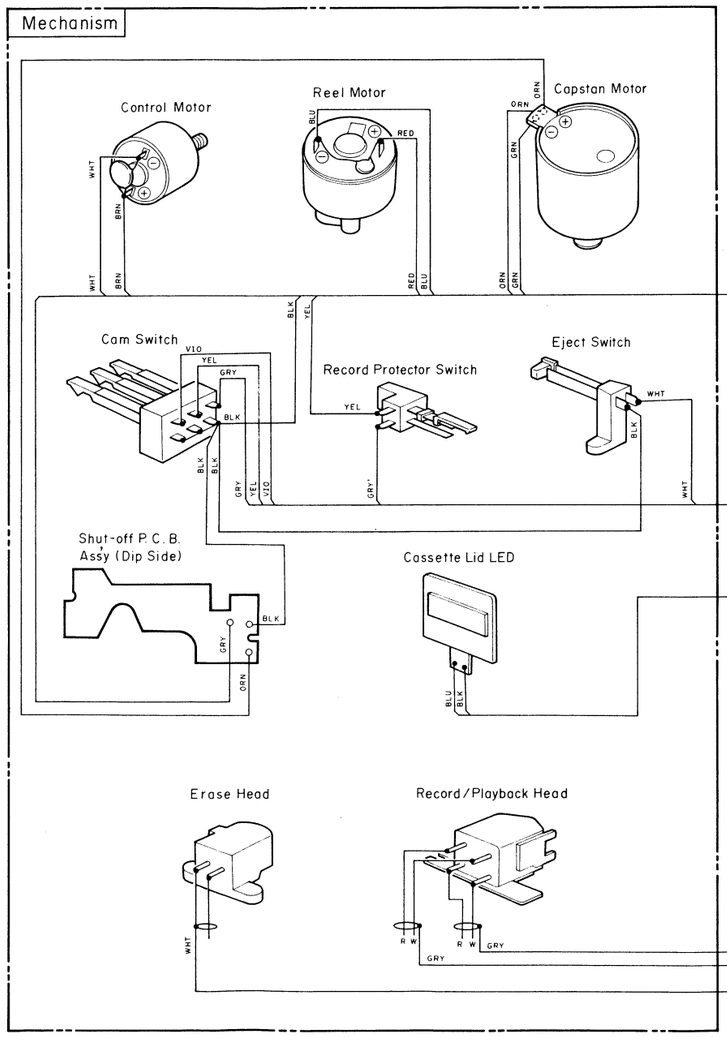

BLK
WHT
RED
Power Transformer
BLU
BLU
BLK
RED
RED


BLK
WHT
RED
Power Transformer
BLU
BLU
BLK
RED
RED


BLK
WHT
RED
Power Transformer
BLU
BLU
BLK
RED
RED


Voltage Selector
BLU
RED
ORN
WHT
BRN
BLK
WHT
BLU
RED
BRN
Power Transformer
BLU
BLU
BLK
RED
RED
40V)


CN-14
Fuse P.C.B. Assy
YEL(BLK)
ORN(WHT)
A.C. Input
ORN (WHT)
YEL (BLK)
BLU
BLU
BLK
RED
RED
Power Transformer
RED
RED
BLU
BLK
BLU
( ): Japan
U.S.A. & CANADA (120V) &(JAPAN (100V))


Mechanism
Control Motor
Reel Motor
Capstan Motor
WHT
BRN
BLU
RED
ORN
GRN
Cam Switch
V10
YEL
GRY
BLK
Record Protector Switch
Eject Switch
WHT
Shut-off P.C.B. Assy (Dip Side)
GRY
ORN
Cassette Lid LED
Erase Head
Record/Playback Head
R W
GRY

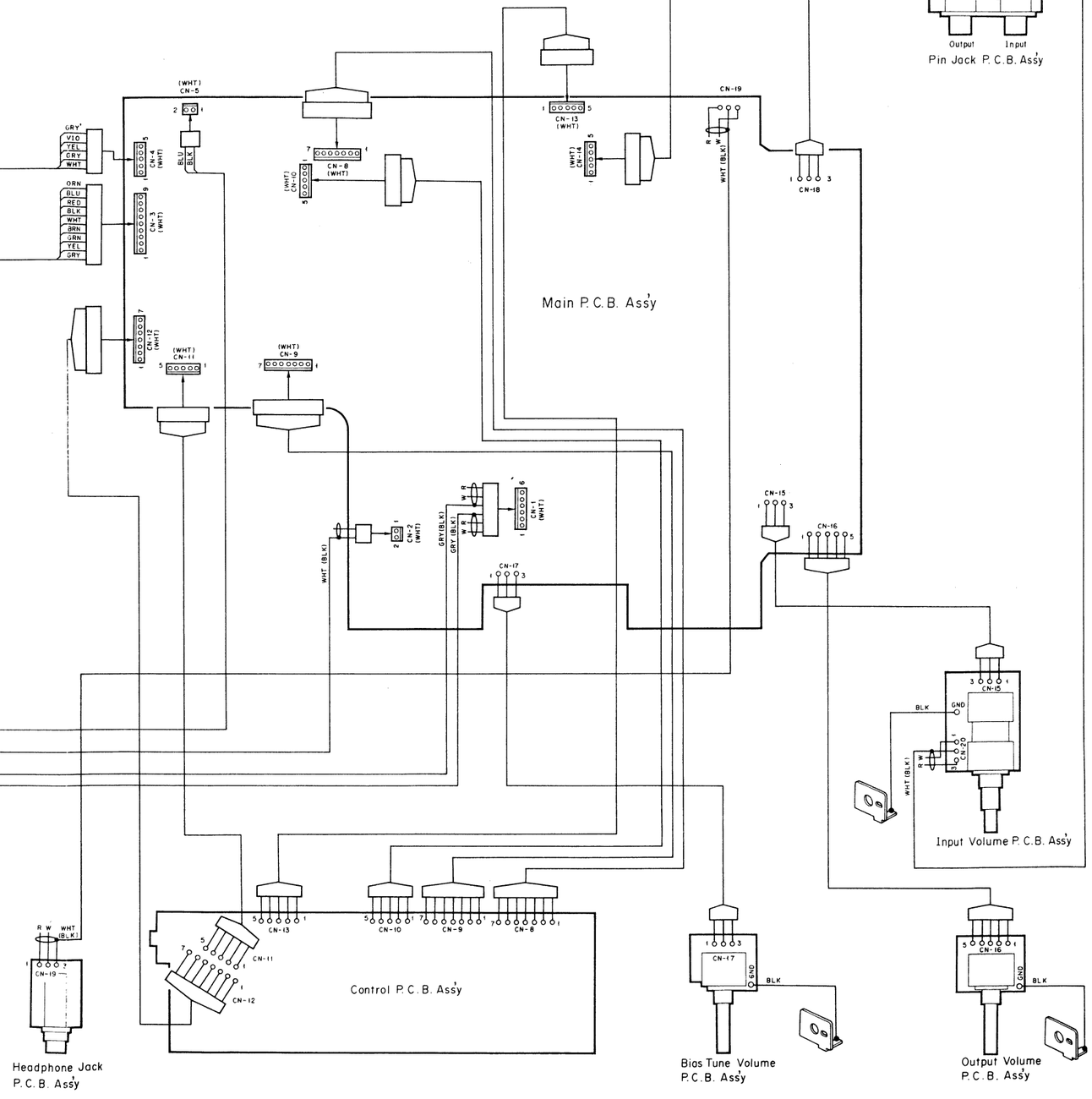

(WHT) CN-5
GRY
VIO
YEL
GRY
WHT
CN-4 (WHT)
ORN
BLU
RED
BLK
WHT
BRN
GRN
YEL
GRY
CN-3 (WHT)
CN-12 (WHT)
(WHT) CN-11
(WHT) CN-9
CN-8 (WHT)
CN-13 (WHT)
CN-19
WHT (BLK)
CN-18
Main P.C.B. Assy
CN-2 (WHT)
GRY(BLK)
CN-6 (WHT)
CN-17
CN-15
CN-16
Pin Jack P.C.B. Assy
Output
Input
GND
CN-20
Input Volume P.C.B. Assy
CN-19
Headphone Jack P.C.B. Assy
CN-13
CN-11
CN-12
CN-10
CN-9
CN-8
Control P.C.B. Assy
CN-17
Bias Tune Volume P.C.B. Assy
CN-16
Output Volume P.C.B. Assy

Fig. 10

11. BLOCK DIAGRAMS

11.1. Amplifier Section

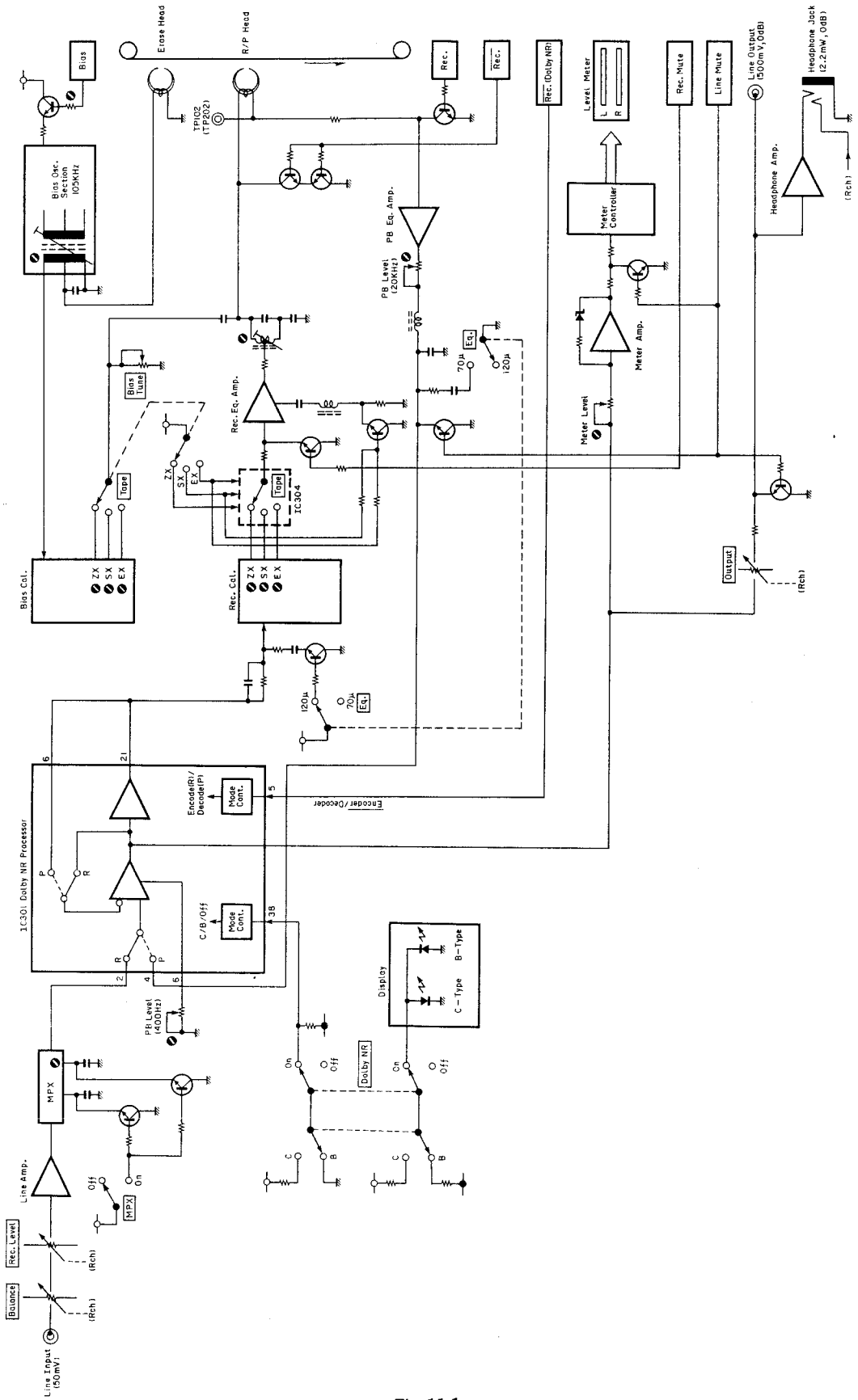


Fig. 11.1

11.2. Mechanism Control Section

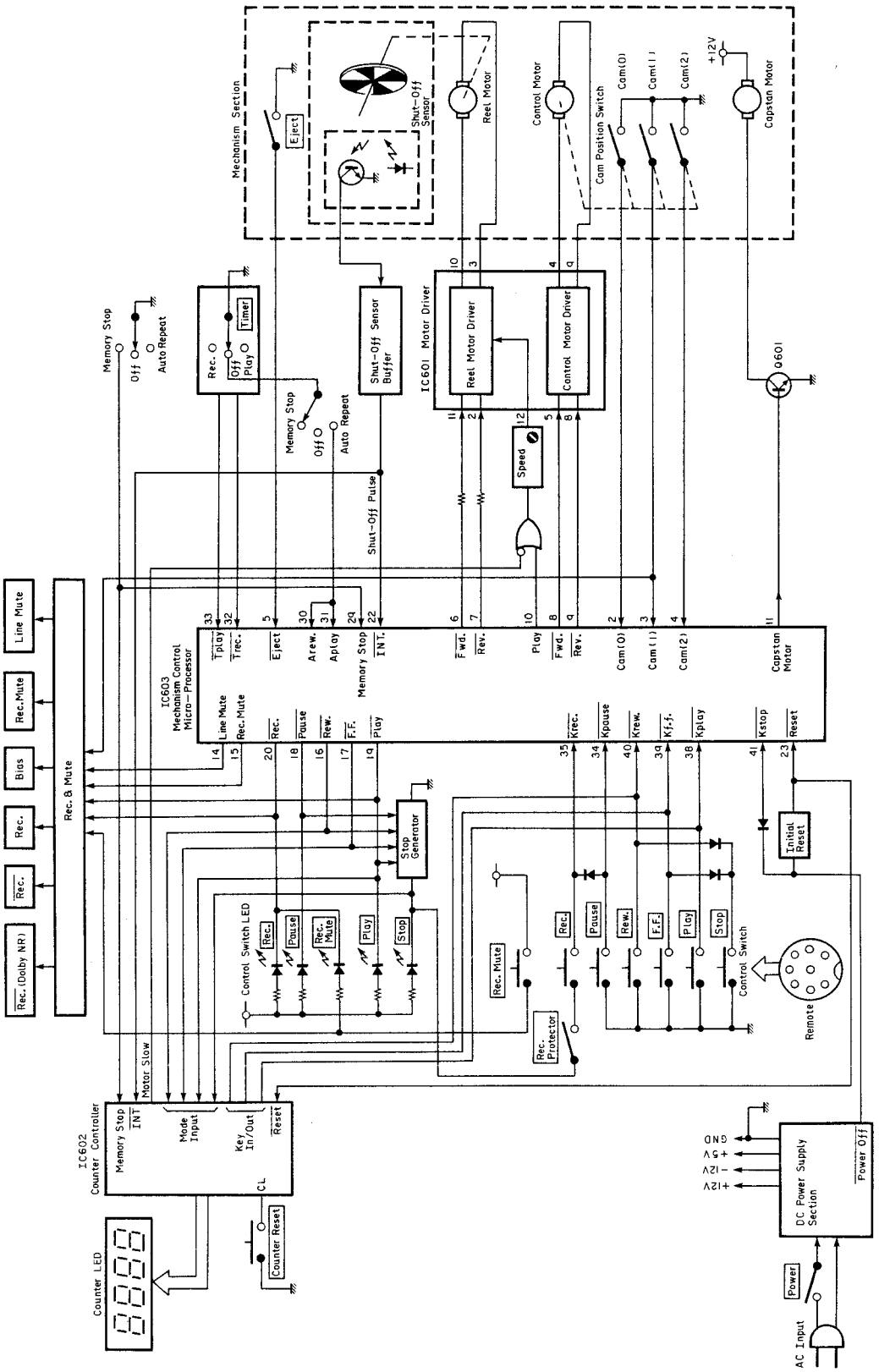


Fig. 11.2

12. TIMING CHARTS AND EQ. AMP. FREQUENCY RESPONSE

12.1. Timing Charts

(1) Overall Timing Chart

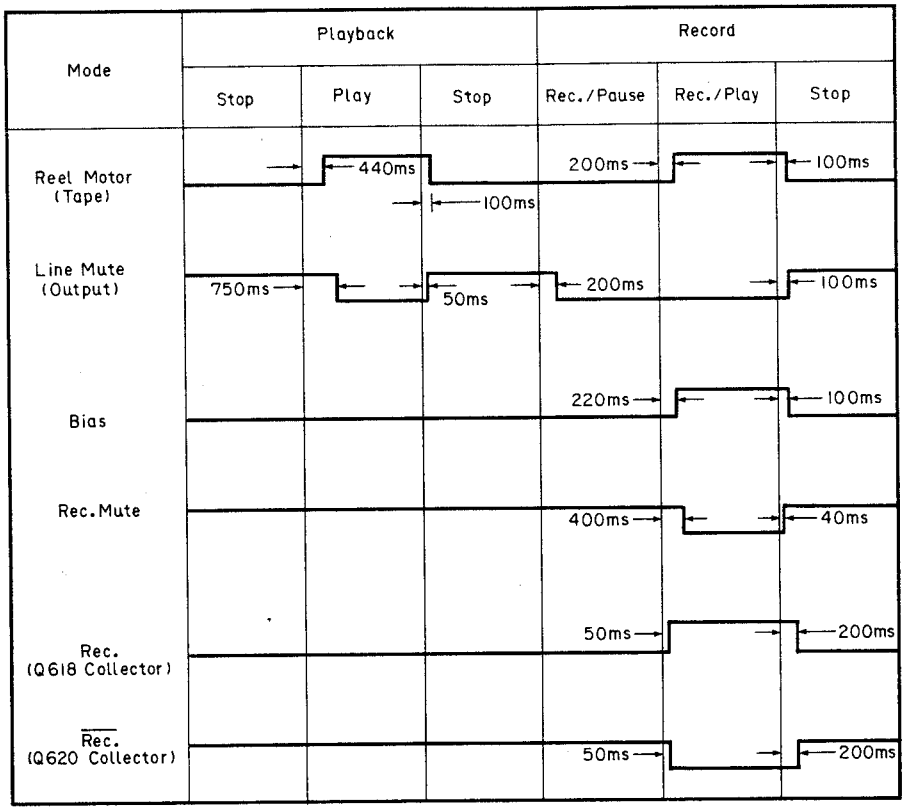


Fig. 12.1.1

(2) Mechanism Control Timing Chart

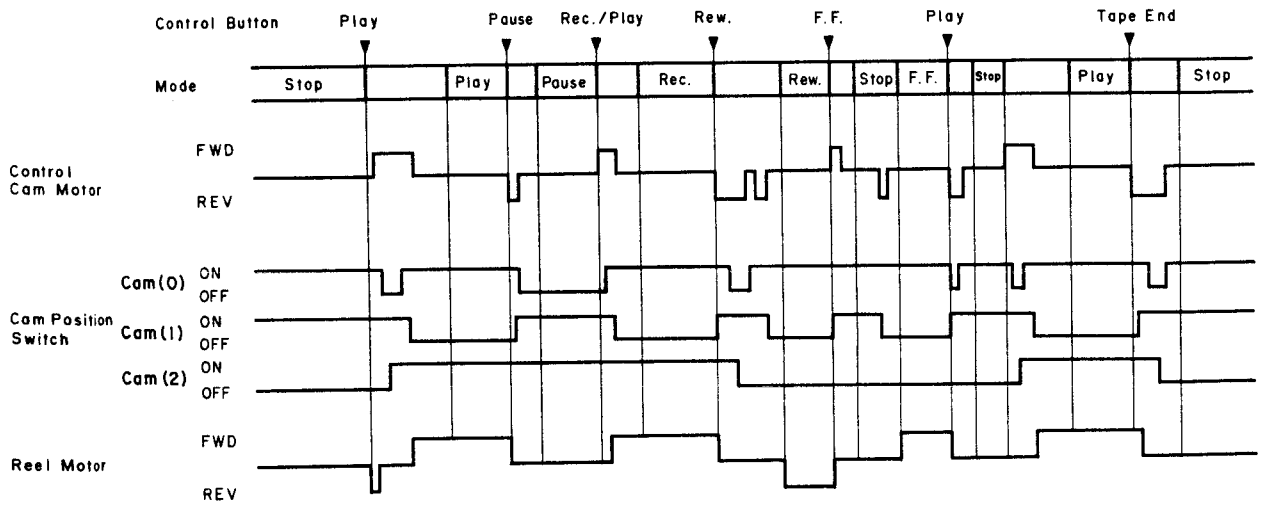


Fig. 12.1.2

12.2. Eq. Amp. Frequency Response
(1) Playback Frequency Response

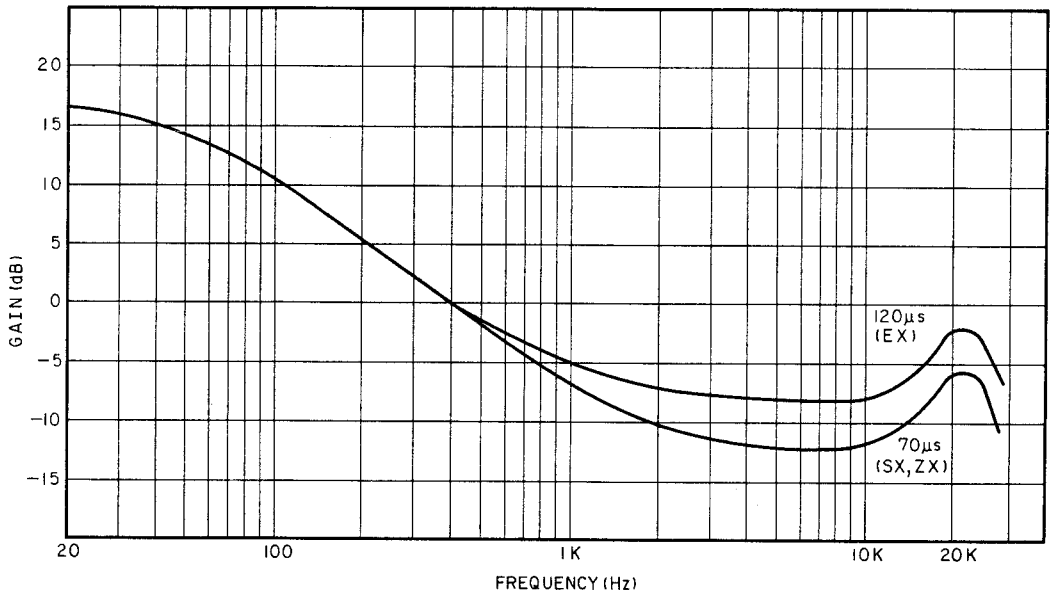


Fig. 12.2.1

(2) Record Current Frequency Response

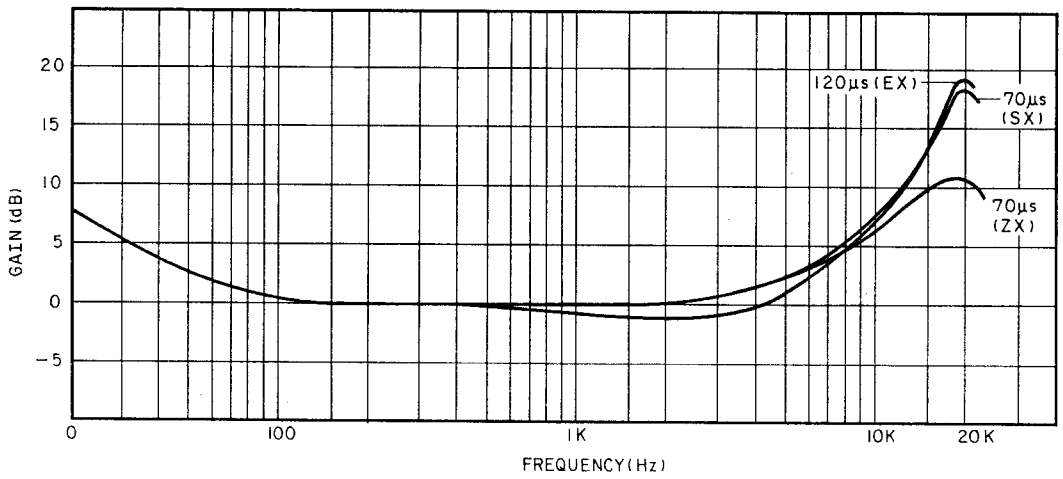


Fig. 12.2.2

13. SPECIFICATIONS

Track Configuration	4 tracks/2-channel stereo
Heads	2 (erase head x 1, record/playback head x 1)
Motors	DC servo motor (capstan drive) x 1 DC motor (reel drive x 1, cam drive x 1)
Power Source	120, 220, 240 or 110/127/220/240 V AC, 50/60 Hz (According to country of sale)
Power Consumption	30 W max.
Tape Speed	1-7/8 ips (4.8 cm/sec.) ±0.5%
Wow and Flutter	Less than 0.11% WTD Peak Less than 0.06% WTD RMS
Frequency Response	20 Hz—20,000 Hz ±3 dB (recording level —20 dB, ZX [Type IV], SX [Type II], EXII [Type I] tape)
Signal to Noise Ratio	**Dolby C-Type NR on** <70 μs, ZX [Type IV] tape> Better than 70 dB (400 Hz, 3% THD, IHF A-WTD RMS) **Dolby B-Type NR on** <70 μs, ZX [Type IV] tape> Better than 64 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Total Harmonic Distortion	Less than 1.0% (400 Hz, 0 dB, ZX [Type IV], SX [Type II], EXII [Type I] tape)
Erasure	Better than 60 dB (100 Hz, +10 dB)
Separation	Better than 36 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV/30k ohms
Output (Line)	0.5 V (400 Hz, 0 dB, output level control at max.) 2.2k ohms
(Headphones)	2.2 mW into 8 ohms (400 Hz, 0 dB, output level control at max.)
Fast-Wind Time	Approx. 80 seconds (with C-60 cassette)
Dimensions	430 (W) x 100 (H) x 265 (D) mm 16-15/16 (W) x 3-15/16 (H) x 10-7/16 (D) inches
Approximate Weight	5.4 kg, 11 lbs. 14 oz.

- Specifications and design are subject to change for further improvement without notice.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- The word "DOLBY" and the Double-D-Symbol are trademarks of Dolby Laboratories Licensing Corporation.

Service Manual

Nakamichi
CR-2, CR-2A, CR-2E, CR-20

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